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The Honorable Chairman and Members of the
Hawaii Public Utilities Commission
Kekuanaoa Building, First Floor
465 South King Street
Honolulu, Hawaii 96813

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PUBLIC UTILITIES
COMMISSION

Dear Commissioners:

Subject: Docket No. 2008-0083
HECO 2009 Test Year Rate Case
Rate Case Updates – Set #7

Enclosed is the seventh set of updates to Hawaiian Electric Company, Inc.'s ("HECO") 2009 test year estimates reflected in the Application, Direct Testimonies, Exhibits, and Workpapers filed with the Commission on July 3, 2008. This set includes updates to the following:

- HECO T-7 – Dan V. Giovanni
- HECO T-15 – Faye Chiogioji

Very truly yours,

Enclosure

cc: Division of Consumer Advocacy
Michael L. Brosch, Utilitech, Inc.
Joseph A. Herz, Sawvel & Associates, Inc.
Dr. Kay Davoodi, Department of Defense
Richard W. Carlile, Department of Defense
Ralph Smith, Larkin & Associates

RATE CASE UPDATE

Ref: D. Giovanni, HECO T-7, Other Production O&M Expense, Production Inventory.

HECO Response:

For HECO T-7 an adjustment to increase Other Production Operations and Maintenance (“O&M”) expenses for the 2009 test year by \$3,176,000 is being made. This adjustment is the net of:

1. HCEI Implementation Study – Environmental Department	\$20,000
2. HCEI Implementation Study – Power Supply Engineering Dept	\$400,000
3. HCEI Implementation Study – System Planning Department	\$900,000
4. HCEI Implementation Study – System Operation Department	\$200,000
5. HCEI Implementation Study – Power Supply O&M Department	\$700,000
6. Green House Gases	\$45,000
7. Renewable Energy Power Purchase Division	\$305,000
8. Renewable Energy Planning Division	\$254,000
9. ITS Cost	(\$41,000)
10. Phone	(\$10,000)
11. 17” LCD Flat Panel Monitors	(\$4,000)
12. CIP CT-1 Maintenance	(\$3,000)
13. CIP CT-1 Operation	(\$12,000)
14. Photovoltaic Engineer	\$33,000
15. Production Simulation	\$55,000

16. Kahe Fuel Oil Tank #11 Maintenance	\$329,000
17. Iwilei Fuel Oil Pipeline	(\$200,000)
18. Breaker Retrofit	(\$79,000)
19. Cathodic Protection	(\$50,000)
20. Project Manager, Power Supply Engineering	\$84,000
21. HCEI Biofuels Outside Engineering	\$50,000
22. HCEI Solar Outside Services	<u>\$200,000</u>
Net Adjustment	<u>\$3,176,000</u>

The Hawaii Clean Energy Initiative ("HCEI") Implementation Study items, except for the amount of \$700,000 for "HCEI Implementation Study – Power Supply O&M Department," were discussed on a preliminary basis in HECO's response to CA-IR-84.

Each of the adjustments is summarized in Attachment 1 to this update. The discussions below provide greater detail on the updates and the financial impacts these changes have to Other Production O&M Expense for the 2009 test year.

HCEI IMPLEMENTATION STUDY

Of the update amount of \$3,176,000, \$2,220,000 relates to the estimated costs in 2009 for outside services for the HCEI Implementation Study described below. HECO's strong preference is to recover the costs for the HCEI Implementation Study through the Renewable Energy Infrastructure Program ("REIP") Surcharge proposed in Docket No. 2007-0416. This is the approach agreed upon by the parties to the HCEI Agreement discussed below. However, the Commission has not yet approved the proposed REIP (which includes the surcharge mechanism), and will also need to explicitly approve the HCEI Implementation Study for the

costs to be recovered through the surcharge. Since the other alternative is to include the costs in the 2009 test year, HECO has included the costs in this update pending approval of the REIP Framework, and the filing of an application pursuant to the Framework for the HCEI Implementation Study.

HECO recognizes that much of the total cost for the HCEI Implementation Study is expected to be incurred in 2009, due to the need to conduct the study in a comprehensive but expedited manner. Thus, if the cost is included in the 2009 test year O&M expenses, consideration should be given to normalizing the test year amount.

In addition to the \$2,220,000 estimated to be incurred in 2009 and charged to Other Production O&M Non-Labor Expense, certain research and development ("R&D") funds (an additional \$677,000 to be incurred by HECO in 2009) for the Oahu Electric System Analysis Study that is already underway (which funds are included in Miscellaneous A&G and discussed in HECO T-14 Rate Case Update) will be used as part of the overall HCEI Implementation Study effort. Since HECO undertakes R&D projects every year, and the overall R&D budget for 2009 does not appear to be extraordinary, HECO does not propose to recover this \$677,000 amount through the REIP Surcharge. [However, HECO is certainly willing to discuss with the parties whether all or part of the cost for the Oahu Electric System Analysis Study also should be deferred for recovery through the surcharge.]

Pursuant to the Energy Agreement between HECO and the Consumer Advocate¹ (the "HCEI Agreement"), the Hawaiian Electric Companies are committed to integrating the

¹ Energy Agreement among the State of Hawaii, Division of Consumer Advocacy of the Department of Commerce & Consumer Affairs, and Hawaiian Electric Companies, dated October 20, 2008 arising out of the HCEI, which documents a course of action to make Hawaii energy independent, and recognizes the need to maintain HECO's financial health in order to achieve that objective. The signatories include the Governor of the State of Hawaii, the

maximum attainable amount of wind energy on their systems. "In order to facilitate a future in which the abundant, sustainable and indigenous wind resources of our islands supply a significant portion of the total energy demand on Oahu", the HCEI Parties committed to the following:

- Hawaiian Electric commits to continue negotiations for the purchase of renewable energy from Grandfathered Projects and to efficiently complete the Oahu Request for Proposals for Renewable Energy Projects ("RE RFP"), which are expected to add up to 235 MW of new clean renewable energy resources located on Oahu.
- Hawaiian Electric commits to integrate, with the assistance of the State to accelerate the commitment, up to 400 MW of wind power into the Oahu electrical system that is produced by one or more wind farms located on either the island of Lanai or Molokai and transmitted to Oahu via undersea cable systems (the "Big Wind" projects).²

The HCEI Agreement provides that Hawaiian Electric is responsible for funding, constructing, operating and maintaining all land-based connections and infrastructure improvements to the existing Hawaiian Electric system up to the interconnection point located at the on-shore termination of the State owned undersea cable systems on Oahu.

The HCEI Agreement also provides that all necessary engineering, technical and financial studies and analyses to identify Big Wind project integration and performance requirements, undersea cable systems requirements, and Hawaiian Electric system

Department of Business, Economic Development and Tourism, the Consumer Advocate, HECO, Hawaii Electric Light Company, Inc. and Maui Electric Company, Limited.

² To facilitate the early adoption of both the Oahu projects and one or more of the neighbor island wind farms, Hawaiian Electric, with support from the State, has committed to work together with the developers of these Big Wind projects and the Commission to bifurcate their project proposals from the ongoing Oahu RE RFP.

modifications, infrastructure additions and operating solutions ("Implementation Studies") will be conducted in a comprehensive but expedited manner.

To successfully accomplish the objective of integrating renewable energy from the neighboring islands, minimize curtailment of as-available energy, and extract the most value of a Big Wind project, subject to confirmation in the independent validation above, the parties agree to work together on a set of Implementation Studies³ to identify:

- The technical requirements of and configuration for the inter-island undersea cable systems to ensure their high availability in order to facilitate the transfer of all available energy from the wind farm.
- The modifications and additions needed for existing Oahu and neighbor island AC transmission grids to reliably interconnect power from the inter-island high-voltage DC cables and transmit the wind farm energy to Oahu's distribution system.
- The energy storage or flexible generation (providing ancillary services and other attributes such as load following, frequency response, regulation, quick start, fast ramping, etc.) needed to offset the variable nature of the wind energy and to minimize the curtailment of wind or other intermittent energy projects.
- The modifications needed on existing generating units (such as cycling conversion, etc.) to offset the variable nature of the wind energy and to minimize the "spilling" of wind.

³ The parties agree to base the design and development of a neighbor island wind farm, the undersea cable systems, and the on-island transmission, generation, energy storage, and all other infrastructure necessary for the effective integration of the wind farm, on the results of these Implementation Studies.

- The changes to operational practices and procedures needed to operate the island grids and integrate their operations with the wind farm.

Finally, the HCEI Parties agreed that the cost of the Implementation Studies will be recovered through the Clean Energy Infrastructure Surcharge (i.e., the REIP Surcharge). Section II.B.1 of the proposed REIP Framework⁴ provides that electric utilities may recover the capital costs, deferred costs relating to software development and licenses, and/or other relevant costs approved by the Commission of a Renewable Energy Infrastructure Project (“REI Projects”) by means of the REIP Surcharge. REI Projects include infrastructure projects that can assist in the integration of more as-available and other non-dispatchable renewable projects onto the electrical grid than could otherwise be added without such projects. Section III.B.1.a.ii of the REIP Framework. By letter dated and filed October 22, 2007, the parties to the docket notified the Commission that they were in agreement on all issues and, with respect to renewable energy implementation study projects (under section III.B.1.a.ii), the costs would be recovered through the REIP Surcharge after the study project is approved by the Commission.

A cornerstone of the HCEI Agreement is the commitment by HECO to integrate, with the assistance of the State to accelerate the commitment, up to 400 MW of wind power into the Oahu electrical system that is produced by one or more wind plants located on either the island of Lanai and/or Molokai and transmitted to Oahu via undersea cable systems (the “Big Wind” projects). This commitment was made in recognition that wind power is a commercially proven

⁴ Exhibit “B” to the HECO Companies” Reply Position Statement, filed September 17, 2008 in Docket No. 2007-0416.

source of renewable energy today that, while limited on Oahu, is abundant on the neighbor islands of Lanai and Molokai.⁵

HECO has received proposals for supply of power to Oahu from developers of large-scale wind plant projects located on the islands of Lanai and Molokai, ranging in size up to roughly 400 MW each, in response to the ongoing RE RFP. To execute on the commitment to the Big Wind projects, the HCEI Agreement expressly recognized that “[a]ll necessary engineering, technical and financial studies and analyses to identify Big Wind project integration and performance requirements, undersea cable systems requirements, and Hawaiian Electric system modifications, infrastructure additions and operating solutions (“Implementation Studies”) will be conducted in a comprehensive but expedited manner” (HCEI Agreement, page 4).

To successfully accomplish the Implementation Studies’ objectives and extract the most value of the Big Wind projects, the HCEI Agreement embodies the commitment of the parties to work together on the Implementation Studies in the following manner:

1. In a collaborative fashion to support a timely implementation of the neighbor island wind plant(s), the undersea cable systems, and the on-island transmission, generation, energy storage, and all other infrastructure necessary for the effective integration of the wind energy;
2. Where the technical and operating requirements⁶ determined in the Implementation Studies should be based upon a robust infrastructure design that maintains reliability levels consistent with industry practices, customer expectations, and the requirements of the PUC;

⁵ The commitment of up to 400 MW of wind energy from wind plants located on Lanai and/or Molokai would be in addition to the wind plants that may be constructed on Oahu.

3. Where the electric grid can be operated to achieve high fuel efficiencies;
4. Utilizing the technical resources of the parties, and the technical assistance of leveraged resources such as the U.S. Department of Energy and its National Laboratories, the Hawaii Natural Energy Institute, and other appropriate technology advisors, both public and private, such as GE Energy and other industry experts; and
5. Basing the design and development of a neighbor island wind plant(s), the undersea cable systems, and the on-island transmission, generation, energy storage, and all other infrastructure necessary for the successful integration of the Big Wind projects, on the results of these Implementation Studies.

Thus, the Implementation Studies, which consist of numerous coordinated studies and analyses on the various issues and topics to be addressed (the detailed scope of many components of which are still being developed and refined), are essential to bring the Big Wind projects on-line. HECO has made significant progress in mapping the overall Implementation Studies and interrelationship of each study component through its work with accomplished technical representatives from the Hawaii Natural Energy Institute ("HNEI"), the National Renewable Energy Laboratory ("NREL"), and the Lawrence Livermore National Laboratory ("LLNL"). In particular, Dr. Dora Yen-Nakafuji of LLNL is assisting in the scoping effort.⁷

⁶ For example, the requirements would include design of the undersea cable systems, the modifications and additions to the Oahu transmission system, the amount of energy storage and/or flexible generation required, the kind of modifications needed to existing generating units, and the changes to operational practices.

⁷ Notably, Dr. Yen-Nakafuji has previously served on loan to the California Energy Commission ("CEC") and was the Contract Manager for the Intermittency Analysis Project, which included the Intermittency Impacts of Wind and Solar Resources on Transmission Reliability, and the Impact of Intermittent Generation on Operation of the California Power Grid. The Intermittency Analysis Project, prepared for the CEC, investigated the transmission impacts of high penetration of intermittent resources such as wind and concentrated solar power on transmission adequacy and system security for different years, seasons and penetration levels.

The comprehensive overall scope of the Implementation Studies requires the involvement and leadership of many departments within HECO to spearhead individual study components within their respective area of responsibility and expertise. The departments conducting components of the Implementation Studies and their respective expenses, resulting in a net adjustment increase in Other Production O&M Non-Labor Expense by a total of \$2,220,000 for Outside Services for the 2009 test year estimate, are as follows:

1. Environmental Dept.	\$20,000
2. Power Supply Engineering Department	\$400,000
3. System Planning Department	\$900,000
4. System Operation Department	\$200,000
5. Power Supply O&M Department	<u>\$700,000</u>
Total	\$2,220,000

Descriptions of the scope of work and status of activities for each department are provided below. Except for item 5, \$700,000 for Power Supply O&M ("PSO&M") Department, all of the other department expenses were described on a preliminary basis in HECO's response to CA-IR-84. Many of the component studies of the overall Implementation Studies are multi-year efforts, and the estimated expenses and years in which the expenses would be incurred are shown in Attachment 2, which is an update to CA-IR-84, Attachment 1, pages 1 and 2. Attachment 2 shows non-labor expenses for 2009 that total \$2,897,000, and includes \$677,000 in R&D funds to be expended by the Energy Solutions process area. All of this cost, with the exception of \$427,000 (\$677,000 less \$250,000; refer to HECO T-14, Rate Case Update, pages 2-3)

represents additional 2009 Test Year O&M expenses for HECO. See also response to CA-IR-161 for additional information about the Oahu Electric System Analysis Study.

It's important to recognize that, although the study component scopes and costs are subject to refinement, in sum they are representative of the overall analytical effort required for the Implementation Studies. As explained in further detail below, the scope of work and cost for certain study components is fairly well determined as contracts for consulting services have already been executed and work is underway. In other instances, requests for proposal are still being refined or HECO is awaiting proposals from vendors in response to RFPs that have been issued.

HCEI IMPLEMENTATION STUDY –
ENVIRONMENTAL DEPARTMENT EXPENSE UPDATE

The adjustment for HCEI Implementation Study – Environmental Department expense is an increase in Other Production Operations non-labor expense of \$20,000 in RA: PJB as shown in Attachment 1 to this update.

In anticipation of the Big Wind projects and other variable generation resources being added to the HECO system in future years, the Environmental Department budgeted an additional \$20,000 for consultant costs to address potential air permitting issues arising from changes in generating system operation and energy dispatch in future years. The addition of large-scale and intermittent wind energy and other as-available renewable energy resources requires greater operational flexibility of existing and planned thermal generating units on the HECO system (such as combustion turbine generators), to be able to respond to rapid changes in the power output renewable resources, which in turn can drive system frequency changes.

Current air permits did not anticipate the need for such operational flexibility caused by the impacts of large-scale wind to HECO's systems and may require modification for this purpose. The need for these types of air permitting costs are anticipated to continue annually beyond 2009 as HECO acquires more information on system impacts through the Implementation Studies and assess the need to potentially adjust its air permits accordingly.

HCEI IMPLEMENTATION STUDY –

POWER SUPPLY ENGINEERING DEPARTMENT EXPENSE UPDATE

The adjustment for HCEI Implementation Study – PSED expense is an increase in Other Production Operations non-labor expense of \$400,000 in RA: PYM as shown in Attachment 1 to this update.

In the near future it may be necessary to cycle (on and off) on a daily basis one or more of HECO's baseload generating units to accommodate more variable generation during off-peak hours. With the addition of on-island variable generation and the Big Wind projects being connected to the HECO grid in the coming years, there is projected to be considerably more energy available from the combination of baseload and variable generation sources than can otherwise be utilized to serve load. The resulting system impacts and the extent to which existing baseload generating units can be cycled daily (i.e., turned off during the off-peak hours) depends on numerous factors such as system stability considerations and is being studied by a consultant under the direction of the System Planning Department under another component of the Implementation Studies. The HECO baseload generating units being considered for cycling duty are Kahe 1, 2, 3 and 4, and Waiiau 7 and 8. It is yet to be determined which of these units can effectively be converted to cycling duty while maintaining system and generating unit

reliability and operability. There will also be capital and O&M cost implications of cycling duty operation of one or more of these units that must be determined.

Under the direction of HECO's Power Supply Engineering Department, HECO has initiated a Generation Cycling Study for these units to identify the existing systems and equipment that would be impacted by cycling operation. This study is anticipated to be a phased, multi-year study. The first phase is scheduled to start in December 2008, with completion in June 2009. The deliverables from the Phase 1 study include conceptual work scopes, preliminary cost estimates and schedules for implementation of cycling conversion projects. Phase 2 of the study would build on the deliverables from Phase 1 and would involve more focused studies on a unit-specific basis of the specific elements of the cycling conversion projects. Phase 2 would commence in the third quarter of 2009, and be completed by the first quarter of 2010.

The estimated costs by year for this phased study are: \$40,000 (2008); \$400,000 (2009); and \$300,000 (2010). Thus, HECO estimates that the necessary outside services for this evaluation will result in an increase of \$400,000 to the 2009 test year estimate for Other Production O&M expense. These cost estimates are subject to revision based on the proposals received from engineering consulting firms for Phase 1 and the information developed in Phase 1 of the study.

A request for proposals for Phase 1 of the study has been issued to three engineering consulting firms (Black & Veatch, Sargent & Lundy and Stanley Consultants). The proposals were received by HECO in November 2008. An outline for the scope of work, requested deliverables and proposed schedule for the Phase 1 study is presented in the Request for Proposals summary in Attachment 3 to this update. The major elements of the Phase 1 study are

site visits for familiarization with the HECO system and generating units, review of unit-specific engineering and operations information, review of previous generating unit cycling studies, identification of equipment limitations and required modifications to enable cycling operation, and development of estimated costs and schedules for required modifications.

HCEI IMPLEMENTATION STUDY –
SYSTEM PLANNING DEPARTMENT EXPENSE UPDATE

The adjustment for HCEI Implementation Study – System Planning Department expense is an increase in Other Production Operations non-labor expense of \$900,000 as shown in Attachment 1. As described in Attachment 2, page 2, these expenses are charged to RAs: PYT and PYB.

To analyze the effects of large penetrations of variable generation on the HECO system (with a focus on the Big Wind projects), the System Planning Department will lead planning studies on the impacts to system operation and production costs. Among the expected results of these studies will be appropriate performance standards to be incorporated in the power purchase agreements for the Big Wind projects, defined mitigation measures to facilitate their integration to the HECO grid, and HECO transmission system infrastructure requirements to ensure grid stability, operability and reliability. The planning studies, employing sophisticated computer models of the HECO system and interconnected facilities, will evaluate the performance of the system and its components through alternative scenarios that include large penetrations of variable generation. The planning studies will also incorporate the results (e.g., system operation parameters, generating unit dynamic operating limits, etc.) based on elements of the

Implementation Studies being performed by the System Operation and PSO&M Departments (described below).

The System Planning Department has led the development of respective scopes for study, execution of contracts for outside consulting services, and the performance of major elements of the Implementation Studies initiated in 2008. First, a study was initiated in October 2008, with Electric Power Systems, Inc. ("EPS"), that includes validation of a system model for the HECO grid, load flow analyses, and short-term (seconds) system stability analyses. The EPS study will also identify the on-island interconnection infrastructure and define the major design objectives for interconnecting the DC undersea cable systems to AC island utility grids. This aspect of the work will be based on applicable planning and operational criteria and practices for the island utility grids. The estimated cost of this work is \$75,860, as identified in the HECO work authorization and scope of work provided as Attachment 4 to this update.

Second, as discussed in HECO's response to CA-IR-161, Phase 1 of the Oahu Electric System Analysis Study being performed by GE Energy was initiated in October 2008. See also, HECO T-14 Rate Case Update, pages 2-3. This study focuses on development and validation of a model of the HECO system using the GE PSLF/MAPS suite of modeling tools. The work product from Phase 1 (model development and validation) will then be applied in Phase 2, scenario analyses of large-scale wind and other renewable resource penetration into the HECO grid. The detailed scope of Phase 2 is currently being developed. In particular, it is expected that Phase 2 will examine system operability and reliability over longer-term periods (minutes to hours) where the fluctuation in power output from variable generation can impact, among other things, system frequency and voltage characteristics. Phase 2 of the GE Energy study will also

evaluate alternative strategies and technologies that could be applied on the grid to mitigate the adverse effects of high penetration of variable generation. Ultimately, Phase 2 is expected to quantify production costs for various operating scenarios and mitigation measures.

During October 2008, a series of meetings were held at HECO's offices in Honolulu with GE Energy, EPS and other technical advisors, including HNEI. At these meetings, HECO presented information on the operation of its system and applicable planning criteria and conducted working sessions with the consultants to launch the intensive data transfer needed for initial model development and validation activities by the consultants. GE Energy and EPS subsequently submitted detailed data requests to HECO and work continues by HECO staff members in response thereto.

The bulk of the effort for 2008 will be to accurately characterize the existing equipment and operating practices of the HECO system and validate the system models against historical system operating data. Ultimately, these models will be used for forward looking scenario analyses. Model development and validation work by EPS is expected to be completed this year along with initial runs of the high-level load flow and system short-term stability analyses. Modeling work by EPS will continue into 2009. It is also expected that EPS will conduct more focused analyses in 2010 for the interconnection of the selected Big Wind projects.

The development and validation of the system long-term model by GE Energy will build upon the system modeling and validation work completed by EPS in 2008, as well as information developed in components of the Implementation Studies led by other HECO departments (e.g. System Operation and PSO&M Departments). The GE Energy Phase 1 work

scope is expected to be implemented by June 2009, with the Phase 2 forward-looking scenario analysis utilizing the validated system model to follow and continue into 2010.

The total estimated costs for 2008, 2009, and 2010 for components of the Implementation Studies led by the System Planning Department are provided in the table below. Beyond the work scopes for the EPS and GE Energy services described above, work scopes are being developed for other study components. For example, HECO is also presently scoping an assessment of energy storage technologies that may be used to supply ancillary services in support of large-scale wind plant integration. Consulting services will be employed to carry forward these assessments upon completion of work scopes. The estimates provided below are necessarily preliminary, but representative of the overall analytical effort required.

System Planning Department Implementation Studies

(Analyses of high penetration of variable generation focusing on Big Wind projects)

Description	2008 Cost	2009 Cost	2010 Cost	RA	Acct
	(In Dollars)				
Analyze system stability implications as affected by changes in commitment of existing reheat baseload generation. Assess system under frequency load shed requirements to maintain system stability for various operating and disturbance response scenarios and increasing levels of intermittent renewable penetration assumptions. Among other matters, the scope will include a review of the coordination between the AGC and LFC, and review the droop response assumptions for the system.	\$70,000	\$150,000	\$150,000	PYT	546
Analyze various scenarios of wind penetration to assess impacts on the generation system. For example, the impact of increased spinning reserve and		\$50,000		PYB	546

unit commitment and dispatch changes on, among other things, system heat rate, variable O&M cost, and number of starts on generating units.					
Assess the ability of storage technologies to provide ancillary services for the HECO grid.	\$10,000	\$50,000	\$50,000	PYT	546
Analyze the potential grid assets needed to integrate large-scale variable wind generation and other renewable resources contemplated for the HECO system.		\$150,000		PYT	546
Conduct scenario analysis employing a validated GE PSLF/MAPS model of the Oahu system that can simulate the second-to-second and minute-to-minute system frequency and voltage as affected by system response to renewable energy resources such as large-scale variable wind generation and mitigation technologies and strategies.		\$500,000		PYT	546
TOTAL	\$80,000	\$900,000	\$200,000		

HCEI IMPLEMENTATION STUDY –

SYSTEM OPERATION DEPARTMENT EXPENSE UPDATE

The adjustment for HCEI Implementation Study – System Operation Department expense is an increase in Other Production Operations non-labor expense of \$200,000 in RA: PRD as shown in Attachment 1 to this update.

An essential component of the Implementation Studies is an evaluation led by HECO's System Operation Department of the operation and capabilities of HECO's Energy Management

System ("EMS")⁸ in a future where there is a high level of variable generation (including up to 400 MW of wind energy produced by wind plants located on Lanai and/or Molokai in addition to wind plants on Oahu) in the Oahu generation mix. The evaluation is comprehensive and will include, for example: 1) assessing the maximum amount of status, analog and accumulator points for the existing EMS and the ability to expand the existing EMS; 2) assessing the amount of information, Automatic Generator Control ("AGC") unit modeling, and EMS scripts needed for the high penetration of variable generation scenarios (including distributed renewable generation); 3) evaluating the expanded use of EMS programs for managing dispatchable firm power generating units to counterbalance variable output renewable generating units; and 4) evaluating a future state level of EMS and dispatch office staff required for the high penetration of variable generation forward-looking scenarios.

These studies will also include an assessment of the estimated cost and schedule for potential required upgrades to the EMS and related exterior systems, such as the Dispatch Training Simulator, the Product Development System, the Historian, the EMS PI system, Webconsoles, and the Back-up Control System. Due to the tight interrelationship of the EMS and the generating unit control systems and unit operation, this evaluation will be closely coordinated with the Implementation Studies underway in the PSO&M Department described below.

To execute this highly technical and specialized evaluation in the accelerated schedule embodied in the HCEI Agreement, HECO will supplement the work of its experienced in-house staff by contracting for services of a qualified consultant(s) with the requisite subject-matter

⁸ HECO's EMS is a Siemens Power-TG, installed and operational on March 31, 2006.

expertise and knowledge of HECO's operations. At this time, HECO estimates that the necessary outside services for this evaluation will result in an increase of \$200,000 to the 2009 Test Year Other Production O&M expense.

HCEI IMPLEMENTATION STUDY –
POWER SUPPLY O&M DEPARTMENT EXPENSE UPDATE

The adjustment for HCEI Implementation Study – PSO&M Department expense is an increase in Other Production Operations non-labor expense of \$700,000 in RA: PIB as shown in Attachment 1 to this update.

Increased levels of variable generation on the HECO grid will require improved dynamic responses among the generating units in order to maintain reliable service and meet system frequency and voltage criteria. The existing, as well as any future generators, will have to counterbalance the load output of the variable generation in order to satisfy system demand at any point in time. Accordingly, components of the Implementation Studies are being performed by the PSO&M Department to characterize and improve the dynamic responses of HECO's existing generating units.

The dynamic load response of a generating unit may be generally characterized in two parts:

1. The "droop" response that automatically occurs when system frequency deviates from its target of 60 Hz. The greater the deviation the greater the response. The droop response typically occurs in a few seconds (or less). Ideally, every generating unit in the system would be calibrated to have a similar droop response so that all the units act in parallel (as a team). Under such conditions no individual unit would have to respond in a disproportionate manner to a frequency deviation.

2. The "ramp rate" response that occurs automatically or manually when the governor is incrementally raised or lowered. This can occur in response to control signals (e.g., "pulses") initiated by the centralized Energy Management System (EMS) Automatic Generation Control (AGC), local AGC at each generating unit, or by manual action of the control operator. Each generating unit may respond on a continuous basis, up or down, between its rated minimum and maximum capability.

The Implementation Studies being conducted by the PSO&M Department include: (a) characterization of the droop responses of each generating unit; (b) adjustment of the droop responses of each generating unit to a similar value (determined, in part, by studies being performed by other HECO departments); (c) characterization of the ramp rates of each generating unit from minimum to maximum capability, and reverse; (d) identification of the factors (equipment, process, operational, etc.) that constrain the ramp rates of each generating unit; (e) characterization of the ramp rates for limited changes in load output (e.g., $\pm 20\%$ of rated maximum capability); and (f) tuning of controls and recalibration of field devices to increase ramp rates to higher values.

The Implementation Studies described above are being performed by the PSO&M Department on an empirical basis without changes in power plant equipment, instrumentation, or controls other than to repair or replace that which is determined to be broken. Consultants will be utilized to bolster the PSO&M Department workforce so that the bulk of the work can be performed on a timely basis. The goal will be to develop specifications for droop response and ramp rates for each generating unit for utilization in Phase 2 of the Oahu Electrical System Analysis Study being performed by GE Energy described above in the discussion of the System

Planning Department Expense Update. At a minimum, HECO will utilize the consulting services of ABB, Inc. and CS Squared. Both of the organizations are familiar with the logic and configuration of the recently-installed electronic control systems at HECO's power plants.

HECO also contemplates utilizing the services of Siemens-Westinghouse and General Electric (original equipment manufacturers), Wood Group (turbine controls expert), Emerson Process Control, and Electric Power Systems, Inc. Scopes of work and cost proposals are currently being developed for this work.

The expense for this work is comprised primarily of outside service costs for the consulting services, and is estimated to be \$200,000, \$700,000, and \$400,000 in 2008, 2009, and 2010, respectively.

GREEN HOUSE GASES EXPENSE UPDATE

The adjustment for Green House Gases expense is an increase in Other Production Operations non-labor expense of \$45,000 in RA: PJB as shown in Attachments 1 and 5 to this update.⁹ Hawaii's Global Warming Solutions Act (2007) requires tracking and reduction of green house gases to 1990 levels by the year 2020. There are various mechanisms to track green house gases, including joining the Climate Registry or other similar organizations. The \$45,000 expense is estimated to cover the cost of membership to such a tracking organization and for consulting services required to independently verify HECO's green house gas inventory. Since tracking of HECO's green house gas emissions is an on-going regulatory requirement, this type of expense will be a recurring annual expense.

⁹ The total Green House Gas expense in 2009 will be \$75,000, and the portion to be charged to HECO is \$45,000. The remaining \$30,000 will be charged to HELCO and MECO.

POWER SUPPLY SERVICES DEPARTMENT,

RENEWABLE ENERGY POWER PURCHASE DIVISION EXPENSE UPDATE

The adjustment for Renewable Energy Power Purchase Division expense is a net increase in Other Production Operations labor expense of \$161,000 and Other Production Operations non-labor expense of \$144,000, or a total of \$305,000, as shown in Attachment 1. The \$161,000 in labor expense is for the net increase for positions associated with the reorganization of the Power Purchase Division into two separate divisions (RAs: PIU and PIC). Additionally, there is \$144,000 for the net increase for non-labor expense. The adjustments are described below and summarized in Attachment 6 to this update.

The Power Supply Services Department has created a new division, Renewable Energy Power Purchase, to manage the increasing number of renewable energy power purchase negotiations. This workload increase has been a direct result of the increase in recent years in the cost of electric energy generated by fossil fuels and the subsequent changes in state and corporate policies taken to mitigate this impact through new renewable energy power purchase contracts. In addition, the HCEI Agreement has formally incorporated accelerated deadlines and project milestones for many of the project proposals by these independent power producers ("IPP"). The focus on integrating up to 400 MW of neighbor island wind energy into the Oahu grid and the desire expressed in the HCEI Agreement to renegotiate existing IPP contracts that are based on the avoided cost of fossil fuel will soon add additional demands to the existing Power Purchase Division.

While the changes in policy and cost of fossil fuel in the last few years have created the need to add additional staffing and reorganize, the HCEI Agreement makes the acquisition of these resources imperative.

This reorganization results in a net increase of two positions across the Power Supply Services Department. The new organizational structure, depicted in Attachment 7, will consist of a new division known as Renewable Energy Power Purchase, RA: PIU. The existing Power Purchase Division will continue as the Power Purchase Contract Administration Division, RA: PIC. The net increase in non-labor expense is a projection of increased outside services costs associated with power purchase contract negotiations and the preparation of applications to the Commission for approval of these contracts.

The Renewable Energy Power Purchase Division will consist of a new Director position, two Contract Negotiators, and one Administrative Assistant. The position description for the Director position is found in Attachment 8 to this update. The hiring process for the Director has begun and the Contract Negotiator and Administrative Assistant positions will be filled as soon as the Director is filled. The new division's primary responsibility will be the negotiation of new renewable energy power purchase contracts for HECO, MECO and HELCO. It is anticipated that one of the two Contract Negotiator positions will be filled by a current Contract Administrator in the existing Power Purchase Division. The Administrative Assistant position will be filled by one of the two Administrative Assistants currently assigned to the Power Purchase Division. The two resulting vacant positions in the Power Purchase Division will not be filled. Thus, the net gain in labor positions used to determine the increase in labor expense is two: one Director level position and one Contract Negotiator position.

The Power Purchase Contract Administration Division will consist of a Director, two Contract Administrators, and one Administrative Assistant. The division will concentrate on administration of HECO power purchase contracts, which are expected to increase significantly as contracts for the three Oahu projects "grandfathered" from competitive bidding are concluded, the HECO Renewable RFP process results in new IPP contracts, and up to 400 MW of neighbor island wind energy is integrated into the Oahu grid. Additionally, this division will continue to administer the complex firm capacity contracts with Oahu fossil fuel IPPs and the City and County's waste to energy project. The net change in the existing Power Purchase Division will be a reduction and transfer of one Contract Administrator and one Administrative Assistant to the new Renewable Energy Power Purchase Division.

The process of filling the new Renewable Energy Power Purchase Director position has begun. It is anticipated that the new Director position will be filled by January 2009. The new Contract Negotiator position will be filled by March 1, 2009.

As a result of HECO, HELCO, and MECO commitments to increased levels of renewable energy from independent power producers, there are also corresponding increases in the non-labor expenses for each company. The 2009 test year estimate previously filed for Other Production Operations non-labor expense for RA: PIC was \$281,150, and included \$277,900 for outside services on HECO projects¹⁰ as shown on Attachment 6, page 2, to this update. As part of this update, however, the expense for outside services is being increased by \$140,400 to \$418,300, and being divided to RAs: PIC and PIU on a 30%/70% basis, respectively. Thus the updated Other Production Operations non-labor expense for RA: PIC is \$128,740, and consists

¹⁰ The outside service expense for HELCO and MECO are charged directly to each company and are not passed through HECO.

of \$125,490 for outside services, \$1,500 for materials and supplies, and \$1,750 for travel. The updated Other Production Operations non-labor expense for RA: PIU is \$296,110, and consists of \$292,810 for outside services, \$1,500 for materials and supplies, and \$1,800 for travel. The total Other Production Operations non-labor expense for RAs: PIC and PIU is \$424,850 (i.e., \$128,740 + \$296,110).

For 2009, the expenses for outside services are estimated to be apportioned between PIC and PIU on a 30%/70% basis because the majority of the work will be devoted to negotiation of new power purchase agreements. The apportionment was based on the following considerations, including:

1. The HCEI Agreement established several new purchase power agreement negotiation milestones,
2. There are three "grandfathered" projects for interconnection to the HECO system for which power purchase agreements will be ongoing. Work started on these in 2008 and the complexity of various technical and financial project issues suggest significant efforts will be required to bring these negotiations to conclusion.
3. Several new projects are expected to result from the evaluation of proposals received in response to the Non-Firm Renewable Energy RFP, and these will require new power purchase agreements.
4. The existing PPA with AES is being amended.
5. Negotiations for the extension of the PPA with Kalaeloa Partners LP will be initiated in 2009.

6. Negotiations with H-Power to modify the PPA consistent with their plans to expand the facility will be initiated in 2009.

SYSTEM PLANNING DEPARTMENT

RENEWABLE ENERGY PLANNING DIVISION EXPENSE UPDATE

The adjustment for Renewable Energy Planning Division expense is an increase in Other Production Operations labor expense of \$149,000 and Other Production Operations non-labor expense of \$105,000, or a total of \$254,000 in RA: PXP, as shown in Attachment 1.

System Planning Department

The expense adjustment for the System Planning Department is \$254,000. This includes \$149,000 in HECO labor expense for a net increase of four positions associated with the formation of the new Renewable Energy Planning Division in the System Planning Department. Additionally, there is \$105,000 in net additional non-labor expense. The adjustments are summarized in Attachment 6 to this update.

The System Planning Department has created a new division, Renewable Energy Planning, to manage the increasing work load in the department associated with the integration of new renewable energy resources. The new organizational structure of the department is depicted in Attachment 9. This work load increase is a direct result of state policy and corporate objectives to mitigate the impact of the increase in recent years in the cost of electric energy generated by fossil fuels, and, ultimately, to achieve a more sustainable, clean, flexible, and economically vibrant and independent energy future for Hawaii. These important state policy and corporate objectives are being significantly realized through new renewable energy power purchase contracts with IPPs.

The System Planning Department has primary responsibility to conduct the necessary planning and technical implementation analyses to integrate new renewable resources in a manner that preserves the stability and operability of the respective HECO, HELCO, and MECO systems and to cost effectively maintain service reliability for our customers. The System Planning Department also serves the critical role of evaluating the cost and cost effectiveness of new renewable energy IPP project proposals, including the determination of utility avoided cost. Thus, the System Planning Department will continue to work closely with the Power Supply Services Department in their essential and complimentary roles to secure new renewable energy power purchase contracts with IPPs for the benefit of HECO, HELCO and MECO customers.

While the heavy work load of IPP project proposals addressed by the System Planning and Power Supply Services Departments has been building for several years now, the HCEI Agreement has formally set accelerated deadlines and project milestones for many new renewable energy IPP projects. The HCEI Agreement focus on integrating up to 400 MW of neighbor island wind energy into the Oahu grid, integrating the three Oahu projects “grandfathered” from competitive bidding, integrating the multiple renewable energy projects that result from the Oahu Renewable RFP, and integrating numerous other new renewable energy projects located across Maui County and the Big Island (such as, among others, two new major wind plant projects on Maui, and a significant new biomass project and the expansion of geothermal power production on the Big Island) has dramatically increased work demands on the System Planning Department as a whole, and most significantly, on the Transmission Planning Division.

The Transmission Planning Division takes the lead in the technical analysis required for new renewable energy project integration. Thus, like the reorganization and expansion of the Power Supply Services Department, the HCEI Agreement makes the expansion of resources in the System Planning Department imperative.

On page 9 of its response to CA-IR-84, HECO recognized the significant undertaking of the Implementation Studies to integrate up to 400 MW of wind energy into the Oahu grid and accordingly identified the need to add two new engineering positions (a Project Manager and a Renewable Energy Engineer) in the System Planning Department¹¹ to conduct these studies (see also HECO's response to CA-IR-70). Effective management of these Implementation Studies alone will require significant internal resources to direct a wide range of in-house technical staff and manage the applied resources of industry experts, technology advisors and consultants. However, as the HCEI process has evolved over the last several months, it was determined that further enhancement to staffing levels and organizational structure within the System Planning Department was needed. State policy and corporate initiatives now require not only those additional resources to support the Implementation Studies, but instead a larger complement of resources to achieve all of the commitments now embodied in the HCEI Agreement. The establishment of the Renewable Energy Planning Division will support the overall level of work demand in the Department and help ensure the broader HCEI vision is realized.

Renewable Energy Planning Division

The addition of the new Renewable Energy Planning Division results in a net increase of four positions in the System Planning Department as follows: one Director, Renewable Energy

¹¹ These two new positions were targeted as additions to the Transmission Planning Division staff count.

Planning; one Senior Renewable Energy Engineer; and two Renewable Energy Engineers. The position descriptions for each of these new positions are found in Attachment 10 to this update.¹²

The new Renewable Energy Planning Division will establish dedicated technical capabilities and focused leadership to direct a wide range of in-house resources and leverage external resources as needed to analyze the impact of new renewable energy projects on the utility systems and achieve their timely and cost-effective integration. The new division's primary responsibility will be to lead the development of appropriate strategies, methods, plans, and policies to achieve successful integration of renewable energy projects for HECO, HELCO and MECO. Their work will include, among other activities:

1. Assessing the effect of new renewable energy projects on the utility grid and ensuring the safe and reliable operation of the system;
2. Developing project performance standards and interconnection requirements;
3. Developing new and/or modifying existing system operating procedures;
4. Identifying appropriate grid-side mitigation measures;
5. Assessing the operational curtailment potential for new resources;
6. Participating in power purchase contract negotiations with IPPs and advising senior management and the utility negotiating team on power purchase contract terms and strategy;
7. Providing utility overview of the IPP project design and construction to assist in ensuring project compliance with interconnection requirements and power purchase contract terms;

¹² Note that the Director, Renewable Energy Planning position description in Attachment 11 is not the same position as the Manager, Renewable Integration position description provided in HECO-721 and discussed in HECO T-7, pages 46-47. Both positions will support the renewable integration effort in the foreseeable future in a complementary manner where the Manager, Renewable Integration provides operational oversight and input based on his extensive experience (30+ years in HECO Power Supply) in the operations and maintenance of HECO's fleet of generating units; knowledge and experience with existing IPPs, and O&M experience with the first large wind turbine on Oahu (Makani Huila) in the late 1970's.

8. Monitoring renewable energy project start-up, testing and performance; and
9. Serving as a technical resource to support utility administration of power purchase contracts.

To date, this work has been managed by the Transmission Planning Division of the System Planning Department. However, as explained in HECO's response to CA-IR-84 (pages 3-5), other important projects and studies that require the attention of the Transmission Planning Division have been deferred to accommodate the growing and high priority work demands in support of integrating new renewable energy resources. Thus, the primary responsibility for this work will be transitioned to the new Renewable Energy Planning Division so that, in time, the Transmission Planning Division will be able to address its existing work backlog and refocus on important core transmission planning activities.

It is expected, however, to take some time to first staff the new division, and then for the new staff to gain experience and familiarity with the unique operational issues of the HECO, HELCO and MECO islanded systems. Thus, the new division will closely coordinate its work with the existing Transmission Planning Division and Manager, Renewable Integration, and will continue to rely heavily on the experience and capabilities of that group over the course of 2009, and then less so over time, to ensure a seamless and effective transition of responsibilities.

The search for a Director, Renewable Energy Planning, has begun in earnest and HECO is evaluating qualified internal candidates while locating and assessing qualified candidates residing in the mainland. Based on progress to date, HECO anticipates filling the Director position by March 1, 2009.

The position of Senior Renewable Energy Engineer requires a skill set and work experience commensurate to that of HECO's Lead Transmission Planning Engineer. For reasons that are explained more fully in a discussion below of the status of hiring activities in the Transmission Planning Division, HECO has experienced significant challenge and delay in filling its vacant Lead Transmission Planning Engineer positions. However, with expanded efforts to secure qualified candidates, HECO projects that the Senior Renewable Energy Engineer position can be filled by April 1, 2009.

With the Renewable Energy Engineer position requiring the least experience of the positions in the new division, HECO projects that these vacancies can be filled without undue delay or difficulty. In fact, candidates for this vacancy may also be considered for other entry level positions within the System Planning Department, such as the Generation Planning Engineer and Transmission Planning Engineer positions. Following interviews, selected candidates will be placed in the position best suited to their strengths, areas of interest, and where they will most benefit the department. Effort to identify and evaluate entry level candidates for these positions is well underway.¹³

In November, 2008, a candidate residing in the mainland accepted HECO's job offer for one of the vacant Renewable Energy Engineer positions and plans to report to work at the end of December 2008. Interviews of candidates to fill the remaining Renewable Energy Engineer

¹³ For example, System Planning Department staff participated in a HECO sponsored University of Hawaii College of Engineering Information Session held on October 23, 2008, featuring HECO engineering job opportunities to students approaching graduation and seeking employment. Further, several engineers in the department also participated in a University of Hawaii College of Engineering Career Fair held on October 29, 2008. Through these recent events, HECO has identified several candidates for entry level positions in the System Planning Department following their graduation in December and interviews are being conducted.

vacancy continue and HECO anticipates that the second Renewable Energy Engineer position can be filled by March 1, 2009.

The staff in the new Renewable Energy Planning Division will have responsibilities supporting HECO, HELCO and MECO. In the 2009 test year, the labor cost for the entire division is allocated between the three utilities at 50%, 25% and 25%, respectively, with the heaviest work load driven by the significant commitment in the HCEI Agreement to the accelerated integration of renewable energy resources on the Oahu grid. Therefore, HECO's O&M expense allocation results in a net increase in labor expense of \$149,000. This amount of \$149,000 supersedes the amount of \$274,000 which was described in HECO's response to CA-IR-84, page 9, and summarized in the labor expense summary table in CA-IR-84, Attachment 1. Attachment 2 to this Rate Case Update, which is a revision to CA-IR-84, Attachment 1, pages 1 and 2, removes the labor expense summary table due to the changes described above.

The net change in non-labor expense of \$105,000 is a projection of increased outside services costs (other than for the Implementation Studies) associated with the study and evaluation of integrating new renewable energy projects on the utility grid while ensuring the safe and reliable operation of the system.

Transmission Planning Division – Staffing Status

The Transmission Planning Division consists of eight positions: one Director; three Lead Transmission Planning Engineers; and four Transmission Planning Engineers. In HECO T-7 (p. 75, line 24, through p. 76, lines 1-2), HECO projected that it would fill the two vacancies at that time in the Transmission Planning Division (both in the Lead Transmission Planning

Engineer position) by the end of 2008. Effective October 13, 2008, a Transmission Planning Engineer was promoted to Lead Transmission Planning Engineer, thereby filling one of the two vacancies in that position, but resulting in a new vacancy in the Transmission Planning Engineer position.

As a result of interviews conducted in October and November 2008, an offer has been extended to a candidate to fill the vacant Transmission Planning Engineer position. With viable back-up candidates also in place, it is anticipated that the Transmission Planning Engineer vacancy will be filled by December 31, 2008.

As explained in HECO's response to CA-IR-84 (pages 1-3), for the one remaining Lead Transmission Planning Engineer vacancy, it remains likely that any qualified external candidate (possessing the desired skill set, knowledge base and experience) for the vacancy will come from out of state. The expanded venues through which HECO has advertised this vacancy includes the HECO website, third-party job listing websites, services secured from a recruiting agency, and job postings on trade publication websites and a power engineering society website. Other venues continue to be evaluated.

While HECO has engaged in discussions with and interviewed mainland candidates responding to these new advertisements, efforts to date to fill the Lead Transmission Planning Engineer vacancy have not been successful due to several reasons, such as the cost of living in Hawaii, the current economic situation, and competing job opportunities. The difficulty in hiring transmission planning engineers is not unique to HECO. Based on discussions with other utilities, transmission system operating companies, and engineering consulting firms, the need for experienced transmission planning engineers has increased world-wide due to factors such as

the expanding global initiative to integrate more renewable resources into electrical grids. The skill set and experience of seasoned transmission planning engineers is essential to that initiative.

HECO also continues to consider hiring a technically competent but less experienced transmission planning engineer that projects the right potential to “grow” into a Lead Transmission Planning Engineer position, and placing him or her on a development plan to gain the necessary experience and full qualifications of the position. While this may not be the preferred means to meet HECO’s staffing and business needs, it may be a necessary step given the tight job market for experienced engineers that meet the highly technical and specialized knowledge and skill set of a Lead Transmission Planning Engineer.

Given the expanded efforts to fill the remaining Lead Transmission Planning Engineer vacancy, notwithstanding the challenges, HECO projects that this position can be filled by March 31, 2009.

Generation Planning Division – Staffing Status

The Generation Planning Division consists of nine positions: one Director; three Senior Planning Engineers; and five Planning Engineers. Effective October 27, 2008, one Senior Planning Engineer left the division to join the Pricing Division in the HECO Energy Services Department. A Planning Engineer within the Generation Planning Division was promoted to fill the vacated Senior Planning Engineer position, thereby leaving one Planning Engineer position vacant. Effective November 10, 2008, a second Senior Planning Engineer was promoted from the division to join the newly formed HECO Corporate Planning Department. Ms. Faye Chiogioji’s (HECO T-15) Rate Case Update addresses the new department. A second Planning

Engineer within the division was promoted to fill the second vacated Senior Planning Engineer position, thereby leaving a second Planning Engineer position vacant.

In October 2008, a candidate search was initiated for the two vacant Planning Engineer positions and interviews are underway. It is anticipated that additional candidates will become available in January 2009, after graduating from college.

As previously noted, candidates may be considered for multiple positions within the System Planning Department, including the Generation Planning Engineer, Transmission Planning Engineer and Renewable Energy Engineer positions. The candidates, if selected, will be placed in the position best suited to their strengths, areas of interest, and where they will most benefit the department and Company.

Based on the interviews conducted to date and the expected pool of candidates to be available in the January 2009 timeframe, and in consideration of where the selected candidates would be the "best fit" within the department, it is anticipated that one of the Generation Planning Engineer positions can be filled by January 31, 2009. Based on further interviews to be conducted in early 2009 of recent college graduates (including those that had attended mainland universities returning home to Hawaii following graduation), it is anticipated that the second Generation Planning Engineer position can be filled by March 31, 2009.

ITS COST EXPENSE UPDATE

The expense adjustment for ITS Cost is a decrease in Other Production Operations non-labor expense of \$41,000 in RA: PIB as shown in Attachment 1. As described in HECO's response to CA-IR-201, the expenses for "Iwilei – Fuel Monitoring System (DTN)" of \$26,000 and "CIP Biofuel Truck Rack/Terminal" of \$15,000 (totaling \$41,000), were inadvertently

included in the 2009 test year estimate for "Other Production O&M Expense" for the PSO&M-Admin responsibility area. These expenses also are included, appropriately, in "Fuel O&M Expense, NARUC 501". Therefore, \$41,000 is being removed from Other Production O&M Expense.

PHONE EXPENSE UPDATE

The expense adjustment for Phone Expense is a decrease in Other Production Operations non-labor expense of \$10,000 in RA: PIB. As described in HECO's response to CA-IR-201, the expenses for the "Smart Data Phone Plan" of \$6,480 and "Clearwire" \$3,240 (totaling \$9,720 and rounded to \$10,000), were inadvertently included as RA: PIB Non-Labor expense. These expenses also were included, correctly, in the 2009 test year estimate for RA: PIH, PIK, and PIW Non-Labor expenses. Accordingly, the expenses will be removed from RA: PIB Non-Labor.

17" LCD FLAT PANEL MONITORS EXPENSE UPDATE

The expense adjustment for 17" LCD Flat Panel Monitors Expense is a decrease in Other Production Operations non-labor expense of \$4,000 in RA: PIB. As described in HECO's response to CA-IR-201, the expense for the "17" LCD Flat Panel Monitors" of \$4,000 was inadvertently included as RA: PIB Non-Labor Charges. Expenses for such items are included in the Information Technology and Services (ITS) budget.

CIP CT-1 MAINTENANCE EXPENSE UPDATE

The expense adjustment for CIP CT-1 Maintenance expense is a decrease in Other Production Maintenance non-labor of \$3,000 in RA: PIZ. As described in HECO's response to CA-IR-208, the expense for "Overhead Crane Annual Inspection" is being reduced by \$2,700 (rounded to \$3,000) from \$4,200 to \$1,500 due to a revised estimate of the expense which

reflects a reduced inspection requirement at the CIP CT-1 facility. See original budget in CA-IR-2, HECO T-7, Attachment 11N, pages 5 to 9.

CIP CT-1 OPERATIONS EXPENSE UPDATE

The expense adjustment for CIP CT-1 Operation expense is a decrease in Other Production Operations non-labor expense of \$12,000 in RA: PIY. As described in HECO's response to CA-IR-207, the expense of \$12,500 (rounded to \$12,000) included for "Comply Ongoing-Permit Reg Air" in RA: PIY for Campbell Local Emergency Area Network ("CLEAN") membership fee for the CIP CT-1 site will be removed. HECO is only required to pay one membership fee to CLEAN and that fee is included in RA: PIK (Kahe Station Ops). See original budget in CA-IR-2, HECO T-7, Attachment 11M, page 2.

PHOTOVOLTAIC ENGINEER EXPENSE UPDATE

The expense adjustment for a Photovoltaic ("PV") Engineer is an increase in Other Production Operations labor expense of \$33,000 in RA: PNG for the Senior Technical Services Engineer (PV Host) position as shown in Attachment 11. PV Host was one of the initiatives identified in the HCEI Agreement and an application to the Commission for this program will be filed by March 31, 2009. The site assessment work will begin in 2008 with implementation beginning as soon Commission approval is received. Starting in July 2009, the additional engineer will be required to conduct site assessments, develop bid specifications for PV developers, evaluate proposals, oversee construction, and monitor the PV system performance. Energy Projects Department's existing staff is fully allocated to other projects and without this new position the PV Host program will not have sufficient resources to meet its aggressive schedule and the expected customer demand for participation. For further details about the

Senior Technical Services Engineer (PV Host) position, see Ms. Faye Chiogioji's (HECO T-15) Rate Case Update.

PRODUCTION SIMULATION EXPENSE UPDATE

The expense adjustment for Production Simulation expense is an increase in Other Production Operations non-labor expense of \$55,000 in RA: PYB. Currently, HECO uses a production simulation computer model, called P-Month, to forecast how the generating units on the system will operate on an hour-by-hour basis. Using the model, generation parameters (such as unit-by-unit energy production, fuel consumption, operating hours and number of starts) can be forecast using inputs (such as load to be served and planned maintenance schedules and forced outages rates for the generating units) that are representative of the forecast period. The vendor for the P-Month model is P Plus Corporation ("PPC"). See the testimony of Mr. Ross Sakuda in HECO T-4, pages 6 to 14, for a more detailed description of how the model works and what the inputs and outputs are.

HECO has been using the P-Month computer model to perform production simulations for approximately 10 years. HECO, Hawaii Electric Light Company, Inc. ("HELCO") and Maui Electric Company, Limited, ("MECO") collectively, the "HECO Companies" or "HECO Utilities" have used the model to perform production simulations to forecast fuel consumption and fuel efficiency for test years in numerous rate cases, including the instant rate case and the HECO 2005 and 2007 test year rate cases (Docket Nos. 04-0113 and 2006-0386, respectively), the MECO test year 1999 and 2007 rate cases (Docket Nos. 97-0346 and 2006-0387, respectively), and the HELCO 1999, 2000 and 2006 test year rate cases (Docket Nos. 97-0420, 99-0207 and 05-0315, respectively). In 2007, the Consumer Advocate acquired a copy of P-

Month so they could validate the results of the HECO Utilities' production simulations used in its rate cases. In HECO's test year 2007 rate case, the Consumer Advocate concluded that the results of their production simulation and HECO's production simulation were "comparable and reasonable."¹⁴

HECO also uses the P-Month model to calculate avoided energy costs using the Non-Utility Generator ("NUG")-in/NUG-out methodology in accordance with the Updated Stipulation to Resolve Proceeding ("Stipulation") that was approved by the Commission on March 11, 2008 in Decision and Order No. 24086 ("D&O No. 24086") in Docket No. 7310. With approval of the Stipulation, the new NUG-in/NUG-out methodology superseded the proxy method of calculating avoided energy costs. The Stipulation stated, in relevant part, that "[t]he new methodology will be implemented 4 months after issuance of the D&O approving this stipulation, including 2 months for the execution of the production simulations, 1 month for review by the parties, and 1 month for any additional simulations. The initial updated avoided energy cost rates and Schedule Q rates would go into effect on the 1st day of the month following this 4 month period."¹⁵ In accordance with the Stipulation, HECO issued the first draft of its avoided energy cost calculations to the parties¹⁶ and recipients¹⁷ on May 13, 2008. The parties were requested to provide comments within one month of the issuance of this first draft. On June 17, 2008, HECO conducted a technical meeting to answer initial questions from the parties and recipients. In

¹⁴ HECO 2007 Test Year Rate Case – Stipulated Settlement Letter, dated September 5, 2007, in Docket No. 2006-0386, Exhibit 1, page 2, paragraph 4.

¹⁵ Stipulation in Docket No. 7310, Exhibit B, pages 1 and 2, paragraph 4.

¹⁶ The parties to the docket were the HECO Utilities; the Consumer Advocate; Mauna Kea Power Company; Hawaii Sugar Planter's Association, now known as the Hawaii Agriculture Research Center ("HARC"); and the Department of the Navy, on behalf of the Department of Defense ("DOD").

¹⁷ The recipients at the time D&O No. 24086 was issued were as follows: For HECO, recipients are H-Power, Tesoro and Chevron. For MECO, recipients are Hawaiian Commercial & Sugar Company and Kaheawa Wind Power. For HELCO, recipients are Wailuku River Hydro, Hawi Renewable Development, Apollo Energy Corporation, and Puna Geothermal Venture.

accordance with the Stipulation, the first set of avoided energy cost rates determined using the NUG-in/NUG-out methodology became effective on August 1, 2008. At the request of Hawi Renewable Development, on September 18, 2008, HECO conducted a workshop for the parties and recipients to explain the methodology and to answer their additional questions.

On August 10, 2008, HECO received a letter from Mr. A. B. Pace, CEO, Apollo Energy Corporation ("AEC") asking, among other things, that HECO "facilitate access to P-Month documentation including the execution of a non-disclosure agreement with the vendor." Upon receiving that request, HECO made numerous attempts, without success, to acquire PPC's approval to release the P-Month user's manual under a Non-Disclosure Agreement ("NDA") to the parties and recipients in Docket No. 7310. At the September 18, 2008 workshop, Mr. Pace's consultant, Mr. Mohamed El-Gasseir, expressed frustration that they were not able to obtain a copy of the P-Month user's manual. HECO responded that it had made several attempts to obtain PPC's consent but did not have success. On September 19, 2008, AEC issued another letter to HECO, requesting "a copy of any documentation explaining the structure and contents of the ACCESS databases used for the August 1 and October 1, 2008 filings." On October 16, 2008, Tawhiri Power, LLC, of which Mr. Pace is a Managing Member, issued a letter stating, among other things, "[t]hus, we are again requesting the documentation that can explain the structure and contents of the ACCESS databases used for the August 1 and October 1, 2008 filings."

Finally, on October 18, 2008, PPC agreed to release a copy of the software documentation to the parties and recipients of Docket No. 7310 upon request and under the NDA. PPC provided to HECO a copy of an NDA for requesting parties and recipients to sign as a

prerequisite to acquiring a copy of the documentation. On October 28, 2008, HECO forwarded the NDA to AEC for their signature and subsequent execution by PPC.

On October 29, 2008, Hawaiian Commercial & Sugar Company ("HC&S") issued a letter to HECO stating, among several things, "it is important for HC&S to have full access to the model (including inputs and calculations) so that it is able to fully understand the model and be able to verify the calculations expeditiously." On October 30, 2008, HECO forwarded a copy of the NDA to HC&S.

Over the course of the implementation phase of Docket No. 7310, it has become extremely difficult to obtain the necessary and critical vendor support for the P-Month model from PPC. Therefore, HECO plans to acquire a new, commercially available production simulation model from a different vendor.

Toward that end, in September, 2008, HECO obtained a budgetary quote for the MAPS production simulation model developed by GE Energy. Attachment 12 to this update is a schedule of licensing options and associated fees for the MAPS model, and Attachment 13 to this update is a brief brochure from GE for their MAPS product. The GE quote was \$75,000 per year for the licensing fee. Because the model would be used for HECO, HELCO and MECO work, but primarily for HECO work, the cost was allocated between the three utilities at 50%, 25% and 25%, respectively. Therefore, HECO's allocation would be \$37,500. HECO currently pays about \$15,000 to PPC for the annual maintenance fee, which covers upgrades and technical support. Of this amount 50%, or \$7,500, is allocated to HECO. When HECO acquires a new, commercially available production simulation model from a different vendor, this \$7,500 cost would not be incurred. Therefore, the net cost of moving away from P-Month and replacing it

with an alternative vendor product (such as GE MAPS) would be \$30,000 for annual licensing fees in the 2009 test year.

It was also estimated that HECO would incur about \$25,000 in 2009 for training costs to learn how to use the new production simulation model. This estimate was based on sending three Senior Planning Engineers and five Planning Engineers at staggered times to two and a half day training sessions in GE Energy offices in New York. HECO estimated a total cost of \$15,000 for airfare, hotel accommodations, and meals for the HECO staff, plus about \$10,000 for the training fee, for a total of \$25,000. This training cost would be borne solely by HECO. Therefore the total estimated cost for this item is \$55,000 in the 2009 test year.

KAHE FUEL OIL TANK #11 EXPENSE UPDATE

The expense adjustment for Kahe Fuel Oil Tank #11 Cleaning and Inspection expense is an increase in Other Production Maintenance non-labor expense of \$329,000 in RA: PIL. This expense item is being deferred from 2008 to 2009 to coincide with the Kahe 3 Biofuel testing described in HECO T-7, page 21, beginning at line 13. Other Production Maintenance expenses from 2009 will be removed, as described below, to result in no net change in 2009 test year Other Production O&M expenses as a result of this added work.

IWILEI FUEL OIL PIPELINE EXPENSE UPDATE

The expense adjustment for Iwilei Fuel Oil Pipeline expense is a decrease in Other Production Maintenance non-labor expense of \$200,000 for "Iwilei pipeline Miscellaneous Repairs" in RA: PIN. This expense item is being removed from 2009 test year Other Production Maintenance expense, and will be performed in 2008, as part of the offset for the increase of

\$329,000 for Kahe Fuel Oil Tank #11 Cleaning and Inspection expense described above. See original budget in CA-IR-2, HECO T-7, Attachment 11G, pages 5 & 6.

BREAKER RETROFIT EXPENSE UPDATE

The expense adjustment for Breaker Retrofit expense is a decrease in Other Production Maintenance non-labor expense of \$79,000. The amount of \$79,000 is made up of three budget adjustments in PIL, PIN, and PIX. These are as follows:

1. PIL – Kahe Breaker Retrofit reduced from \$60,000 to \$31,000 in 2009. See original budget in CA-IR-2, HECO T-7, Attachment 11E, pages 4-5. PIL reduction equals \$29,000.
2. PIN – Honolulu Breaker Retrofit reduced from \$75,000 to \$50,000 in 2009. See original budget in CA-IR-2, HECO T-7, Attachment 11G, pages 5 & 6. PIN reduction equals \$25,000.
3. PIX – Waiau Breaker Retrofit reduced from \$60,000 to \$35,000 in 2009. See original budget in CA-IR-2, HECO T-7, Attachment 11L, pages 6-10. PIX reduction equals \$25,000.

This expense total is being removed from 2009 test year Other Production Maintenance expense as part of the offset for the increase of \$329,000 for Kahe Fuel Oil Tank #11 Cleaning and Inspection expense described above.

CATHODIC PROTECTION EXPENSE UPDATE

The expense adjustment for Cathodic Protection consultant expense is a decrease in Other Production Maintenance non-labor expense of \$50,000 in RA: PIX. This expense item is being removed from the 2009 test year Other Production Maintenance expense as part of the offset for

the increase of \$329,000 for Kahe Fuel Oil Tank #11 Cleaning and Inspection expense described above. See original budget in CA-IR-2, HECO T-7, Attachment 11L, pages 6-10.

POWER SUPPLY ENGINEERING DEPARTMENT

PROJECT MANAGER

The expense adjustment for an additional Project Manager position is being added to the Project Management Division in the Power Supply Engineering Department is an increase in Other Production Operations labor expense of \$84,000 in RA: PYJ. See Attachment 1. This additional position is needed based on a forecasted sustained increase in the project management workload associated with the projects, programs and studies required to fulfill the HECO commitments made in the HCEI Agreement. These future projects include projects for the conversion of baseload generating units to cycling operation, conversion of fossil-fired generating units to biofuels, and improvements in operational flexibility of existing generating units to enable increased integration of variable renewable generation onto the HECO system. Other projects include projects to enable the cold layup (i.e., long term de-activation) of generating units and fuel infrastructure additions to accommodate biofuels.

HCEI BIOFUELS OUTSIDE ENGINEERING

The expense adjustment for HCEI Biofuels Outside Engineering is an increase in Other Production Maintenance non-labor expense of \$50,000 in RA: PNG. One of the commitments in the HCEI Agreement is to operate HECO's Substation DG units firing biofuels. An engineering study and technical evaluation of the conversion of the existing Substation DG units from diesel to biodiesel will occur in 2009. As described in the HECO IRP-4, section 10.4.12, HECO committed to biodiesel emissions tests of an identical DG unit (in San Diego,

California). This testing was completed November 20, 2008, and HECO is developing plans for additional, longer run-hour biodiesel testing on similar engine (site to be determined).

HCEI SOLAR OUTSIDE SERVICES

The expense adjustment for HCEI Solar Outside Services is an increase in Other Production Operations non-labor expense of \$200,000 in RA: PNG. As stated in the HCEI Agreement, HECO, HELCO, and MECO will jointly submit an application to the Commission for a utility PV Host Program by March 31, 2009. This outside services expense of \$200,000 is to support the development of the PV Host program, prepare the filing to the Commission, and provide assistance to evaluate the applications from customers to participate in the pilot PV Host Program.

A breakdown of the \$200,000 expense in 2009 is as follows:

<u>Outside Service</u>	<u>Provider</u>	<u>Amount</u>	<u>Scope</u>
Engineering	to be determined	\$ 75,000	System Integration Analysis
Consulting	to be determined	\$ 25,000	Project Site Assess Support
Consulting	to be determined	\$ 75,000	Program Design
Legal	Goodsill Anderson, Quinn, & Stifel	<u>\$ 25,000</u>	Regulatory Filing Support
TOTAL		<u>\$200,000</u>	

SUMMARY

As indicated in Attachment 1, page 1, the net effect of these adjustments is an increase in the 2009 test year estimate for Other Production O&M expense of \$3,176,000. The amount of \$3,176,000 is comprised of an increase in Other Production Operations labor expense of

\$427,000, an increase in Other Production Operations non-labor expense of \$2,702,000, and a increase in Other Production Maintenance non-labor expense of \$47,000 for a net increase in Other Production O&M non-labor expense of \$2,749,000.

CIP CT-1 STEP INCREASE UPDATE AND

OTHER PRODUCTION O&M EXPENSE REVENUE REQUIREMENT SCENARIOS

The costs related to CIP CT-1 described in HECO-702 and HECO-WP-709 have been updated to reflect the Rate Case Update as shown in Attachment 14. The various cost scenarios for Other Production O&M Expense are summarized below:

1. Rate Case Update Base Case for 2009 test year: \$83,567,000.
2. Rate Case Update Interim without CIP CT-1: \$82,093,000.
3. Rate Case Update with full cost of CIP CT-1: \$84,643,000.
4. Rate Case Update without HCEI Implementation Study: \$81,347,000.
5. Rate Case Update without HCEI Implementation Study and without CIP CT-1: \$79,873,000.
6. Rate Case Update without HCEI Implementation Study and with full cost of CIP CT-1: \$82,423,000.

Each of the different cost scenarios are described in greater detail in Attachment 14, pages 1-8.

If the assumption to update the production simulation with the September 2008 Sales and Peak Forecast (which projected lower sales for the 2009 test year) was applied, the total emission fees for the test year would reduce from \$958,000 to \$915,000 or a net decrease of \$43,000. The calculation of the revised amount of \$915,000 for the Emissions Fee expense is shown in Attachment 15 to this update. This decrease would be applied to Other Production Operations non-labor expense in RA: PIB and the total Rate Case Adjustment would be \$3,133,000 as

shown in Attachment 14, pages 10 and 11, column (B). The six scenarios above would change and are summarized below and in Attachment 14, pages 9 to 11:

1. Rate Case Update Base Case for 2009 test year: \$83,524,000.
2. Rate Case Update Interim without CIP CT-1: \$82,054,000.
3. Rate Case Update with full cost of CIP CT-1: \$84,600,000.
4. Rate Case Update without HCEI Implementation Study: \$81,304,000.
5. Rate Case Update without HCEI Implementation Study and without CIP CT-1: \$79,834,000.
6. Rate Case Update without HCEI Implementation Study and with full cost of CIP CT-1:
\$82,380,000.

HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year (\$1000s)

RATE CASE UPDATE SUMMARY - OTHER PRODUCTION O&M EXPENSE

<u>Line</u>		(A)	(B)	(C)	(D)	(E)	(F)
		<u>OPER BUDGET</u>	<u>BUDGET ADJ</u>	<u>NORM</u>	<u>TY EST @ DIRECT</u>	<u>TOTAL ADJUST (from pg 5)</u>	<u>TY RATE CASE UPDATE</u>
	HECO T-7 OTHER PRODUCTION O&M EXPENSE						
	PRODUCTION OPERATIONS						
1	LABOR	15,373	29		15,402	427	15,829
2	NON-LABOR	17,011	(10)	(3)	16,998	2,702	19,700
3	TOTAL	32,384	19	(3)	32,400	3,129	35,529
	PRODUCTION MAINTENANCE						
4	LABOR	17,610			17,610	0	17,610
5	NON-LABOR	30,393	(12)		30,381	47	30,428
6	TOTAL	48,003	(12)	0	47,991	47	48,038
	OTHER PRODUCTION O&M - TOTAL						
7	LABOR	32,983	29	0	33,012	427	33,439
8	NON-LABOR	47,404	(22)	(3)	47,379	2,749	50,128
9	TOTAL	80,387	7	(3)	80,391	3,176	83,567

HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year (\$1000s)

RATE CASE UPDATE SUMMARY - OTHER PRODUCTION O&M EXPENSE

Summary of Adjustments

Line	ADJUSTMENT NUMBER							SUBTOT
	1	2	3	4	5	6	7	
	IMPL ST	IMPL ST	IMPL ST	IMPL ST	IMPL ST	Green	RE	
	ENV	PSED	SYSPL	SYSOP	PSOM	House	Pwr Purch	
	(PJB)	(PYM)	(PYT+PYB)	(PRD)	(PIB)	(PJB)	(PIC+PIU)	
	Note (1)	Note (1)	Note (1)	Note (1)	Note (2)	Note (3)	Note (4)	
HECO T-7								
OTHER								
PRODUCTION O&M EXPENSE								
PRODUCTION OPERATIONS								
1 LABOR	-	-	-	-	-	-	161	161
2 NON-LABOR	20	400	900	200	700	45	144	2,409
3 TOTAL	20	400	900	200	700	45	305	2,570
PRODUCTION MAINTENANCE								
4 LABOR	-	-	-	-	-	-	-	-
5 NON-LABOR	-	-	-	-	-	-	-	-
6 TOTAL	-	-	-	-	-	-	-	-
OTHER PRODUCTION O&M- TOTAL								
7 LABOR	-	-	-	-	-	-	161	161
8 NON-LABOR	20	400	900	200	700	45	144	2,409
9 TOTAL	20	400	900	200	700	45	305	2,570
NOTE	(A)	(A)	(A)	(A)	(A)			

See Notes on page 6.

HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year (\$1000s)

RATE CASE UPDATE SUMMARY - OTHER PRODUCTION O&M EXPENSE

Summary of Adjustments

Line		SUBTOT PREVIOUS PAGE	ADJUSTMENT NUMBER					SUBTOT
			8 RE Planning (PXP) Note (5)	9 ITS Cost (PIB) Note (6)	10 Phone (PIB) Note (7)	11 17" LCD (PIB) Note (8)	12 CIP CT-1 Maint (PIZ) Note (9)	
	HECO T-7							
	OTHER							
	PRODUCTION O&M EXPENSE							
	PRODUCTION OPERATIONS							
1	LABOR	161	149	-	-	-	-	310
2	NON-LABOR	2,409	105	(41)	(10)	(4)	-	2,459
3	TOTAL	2,570	254	(41)	(10)	(4)	-	2,769
	PRODUCTION MAINTENANCE							
4	LABOR	-	-	-	-	-	-	-
5	NON-LABOR	-	-	-	-	-	(3)	(3)
6	TOTAL	-	-	-	-	-	(3)	(3)
	OTHER PRODUCTION O&M- TOTAL							
7	LABOR	161	149	-	-	-	-	310
8	NON-LABOR	2,409	105	(41)	(10)	(4)	(3)	2,456
9	TOTAL	2,570	254	(41)	(10)	(4)	(3)	2,766

See Notes on page 6.

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HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year (\$1000s)

RATE CASE UPDATE SUMMARY - OTHER PRODUCTION O&M EXPENSE

Summary of Adjustments

		ADJUSTMENT NUMBER						
		13	14	15	16	17	18	
		CIP CT-1	PV	Prod	Kahe	Iwilei	Breaker	
SUBTOT		Oper	Engineer	Sim	FOT11	Pipeline	Retrofit	
PREVIOUS		(PIY)	(PNG)	(PYB)	(PIL)	(PIN)	(PIL/PIN/PIX)	
PAGE		<u>Note (10)</u>	<u>Note (11)</u>	<u>Note (12)</u>	<u>Note (13)</u>	<u>Note (13)</u>	<u>Note (13)</u>	<u>SUBTOT</u>
Line								
	HECO T-7							
	OTHER							
	PRODUCTION O&M EXPENSE							
	PRODUCTION OPERATIONS							
1	LABOR	310	-	33	-	-	-	343
2	NON-LABOR	2,459	(12)	-	55	-	-	2,502
3	TOTAL	2,769	(12)	33	55	-	-	2,845
	PRODUCTION MAINTENANCE							
4	LABOR	-	-	-	-	-	-	-
5	NON-LABOR	(3)	-	-	329	(200)	(79)	47
6	TOTAL	(3)	-	-	329	(200)	(79)	47
	OTHER PRODUCTION O&M- TOTAL							
7	LABOR	310	-	33	-	-	-	343
8	NON-LABOR	2,456	(12)	-	55	329	(200)	2,549
9	TOTAL	2,766	(12)	33	55	329	(200)	2,892

See Notes on page 6.

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HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year (\$1000S)

RATE CASE UPDATE SUMMARY - OTHER PRODUCTION O&M EXPENSE

Summary of Adjustments

Line		SUBTOT PREVIOUS PAGE	ADJUSTMENT NUMBER				TOTAL ADJUST
			19 Cathodic Protect (PIX) <u>Note (13)</u>	20 Project Manager (PYJ) <u>Note (14)</u>	21 HCEI Biofuels (PNG) <u>Note (15)</u>	22 HCEI Solar (PNG) <u>Note (16)</u>	
	HECO T-7 OTHER PRODUCTION O&M EXPENSE						
	PRODUCTION OPERATIONS						
1	LABOR	343	-	84	-	-	427
2	NON-LABOR	2,502	-	-	-	200	2,702
3	TOTAL	2,845	-	84	-	200	3,129
	PRODUCTION MAINTENANCE						
4	LABOR	-	-	-	-	-	-
5	NON-LABOR	47	(50)	-	50	-	47
6	TOTAL	47	(50)	-	50	-	47
	OTHER PRODUCTION O&M- TOTAL						
7	LABOR	343	-	84	-	-	427
8	NON-LABOR	2,549	(50)	-	50	200	2,749
9	TOTAL	2,892	(50)	84	50	200	3,176

See Notes on page 6.

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HAWAIIAN ELECTRIC COMPANY, INC.
2009 Test Year (\$1000S)
RATE CASE UPDATE SUMMARY

HECO T-7
OTHER PRODUCTION O&M EXPENSE

NOTES:

- (1) Implementation Studies cost for these departments described in response to CA-IR-84.
 - (2) Implementation Studies, PSO&M Engineering/Consulting - Dynamic Response HECO Units.
 - (3) Green House - NARUC 506, PJB875PHENENPJZZZZZ.
 - (4) New Power Purchase Renewable Energy Division in Power Supply Services Department, NARUC 557. 2 Staff Added.
 - (5) New Renewable Energy Planning Division in System Planning Department, NARUC 546. 4 Staff Added.
 - (6) See CA-IR-201. To remove RA: PIB Outside Service charges that are related to Fuel Expenses, not Production O&M.
 - (7) See CA-IR-201. To remove RA: PIB Outside Service phone charges that are included in other RAs.
 - (8) See CA-IR-201. To remove RA: PIB Material charges that are included in the ITS budget.
 - (9) See CA-IR-208. To reduce CIP CT-1 Maintenance cost. Budgeted annual overhead crane inspection cost reduced from \$4,200 to \$1,500.
 - (10) See CA-IR-207. To remove CIP CT-1 Operation cost for CLEAN membership.
 - (11) For Energy Project Dept additional PV Engineer staff to conduct photovoltaic studies; see HECO T-15, Rate Case Update.
 - (12) Additional cost for replacement Production Simulation Program. NARUC 500, PYB200WSTNENPYZZZZZ.
 - (13) Kahe Fuel Oil Tank #11 Cln/Insp moved from 2008 to 2009 for \$329,000. Cost offset by jobs that moved out from 2009. These jobs are:
 - \$200,000 - Removed \$200,000 for Iwilei Pipeline Repair 2009. See original budget in CA-IR-2, HECO T-7, Att 11G, pages 5 & 6.
 - \$25,000 - Honolulu Breaker Retrofit reduced from \$75,000 to \$50,000 in 2009. See original budget in CA-IR-2, HECO T-7, Att 11G, pages 5 & 6.
 - \$25,000 - Waiau Breaker Retrofit reduced from \$60,000 to \$35,000 in 2009. See original budget in CA-IR-2, HECO T-7, Att 11L, pages 6-10.
 - \$29,000 - Kahe Breaker Retrofit reduced from \$60,000 to \$31,000 in 2009. See original budget in CA-IR-2, HECO T-7, Att 11E, pages 4-5.
 - \$50,000 - Removed \$50,000 for Waiau Cathodic Protection Consultant in 2009. See original budget in CA-IR-2, HECO T-7, Att 11L, pages 6-10.
 - (14) New position in the Project Management Division in the Power Supply Engineering Dept for the sustained increase in project management workload.
See additional comments in HECO T-7, Rate Case Update.
 - (15) HCEI Biofuels Outside Engineering - See HECO T-7, Rate Case Update.
 - (16) HCEI Solar Outside Services - See HECO T-7, Rate Case Update.
- (A) HCEI Activities: HECO proposes to recover these Outside Service expenses through the REIP surcharge.
Summation of (A) \$2,220,000.

Hawaiian Electric Company, Inc.
2009 Test Year
Cost Estimate Summary to Support Implementation Studies
(in dollars)

	Cost Clas	2008	2009	2010	Total
NON-LABOR					
System Planning Dept.	NE-O&M	\$ 80,000	\$ 900,000	\$ 200,000	\$ 1,180,000
PS Engineering Dept.	NE-O&M	\$ 40,000	\$ 400,000	\$ 300,000	\$ 740,000
System Operation Dept.	NE-O&M	\$ -	\$ 200,000	\$ -	\$ 200,000
Power Supply Services Dept.	NE-FUEL	\$ -	\$ -	\$ 50,000	\$ 50,000
Environmental Dept.	NE-O&M	\$ 20,000	\$ 20,000	\$ 20,000	\$ 60,000
Energy Solutions Dept.	NE-R&D	\$ 72,000	\$ 677,000	\$ -	\$ 749,000
PSO&M Dept.	NE-O&M	\$ 200,000	\$ 700,000	\$ 400,000	\$ 1,300,000
Totals- From Detail Sheet		\$ 412,000	\$ 2,897,000	\$ 970,000	\$ 4,279,000

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Hawaiian Electric Company, Inc.

2009 Test Year

Cost Estimates for Outside Services to Support Implementation Studies (in dollars)

	Outside Services Scope	Cost Class	Division Budget	2008	2009	2010	Total
System Planning Dept.	Analyze system stability implications as affected by changes in commitment of existing reheat baseload generation. Assess system under frequency load shed requirements to maintain system stability for various operating and disturbance response scenarios and increasing levels of intermittent renewable penetration assumptions. Among other matters, the scope will include a review of the coordination between the AGC and LFC, and review the droop response assumptions for the system.	NE- O&M / Acct 546 / Oth Pwr Oper	Transmission Planning Division (PYT)	\$ 70,000	\$ 150,000	\$ 150,000	\$ 370,000
	Assess the ability of storage technologies to provide ancillary services for the HECO grid.	NE- O&M / Acct 546 / Oth Pwr Oper	Transmission Planning Division (PYT)	\$ 10,000	\$ 50,000	\$ 50,000	\$ 110,000
	Conduct scenario analysis employing a validated GE PSLF/MAPS model of the Oahu system that can simulate the second-to-second and minute-to-minute system frequency and voltage as affected by system response to renewable energy resources such as large-scale variable wind generation and mitigation technologies and strategies.	NE- O&M / Acct 546 / Oth Pwr Oper	Transmission Planning Division (PYT)		\$ 500,000	\$ -	\$ 500,000
	Analyze the potential grid assets needed to integrate large-scale variable wind generation and other renewable resources contemplated for the HECO system.	NE- O&M / Acct 546 / Oth Pwr Oper	Transmission Planning Division (PYT)	\$ -	\$ 150,000	\$ -	\$ 150,000
	Analyze various scenarios of wind penetration to assess impacts on the generation system. For example, the impact of increased spinning reserve and unit commitment and dispatch changes on, for example among other things, system heat rate, variable O&M cost, and number of starts on generating units.	NE- O&M / Acct 546 / Oth Pwr Oper	Generation Planning Division (PYB)	\$ -	\$ 50,000	\$ -	\$ 50,000
	Subtotal System Planning Dept			\$ 80,000	\$ 900,000	\$ 200,000	\$ 1,180,000
Power Supply Engineering Dept.	Boiler - Determine the unit-specific feasibility and cost of converting one or more of HECO's reheat, baseload units to cycling duty, and its impact on maintenance scope/schedules.	NE- O&M / Acct 546 / Oth Pwr Oper	Power Plant Engineering Division (PYM)	\$ 10,000	\$ 150,000	\$ 100,000	\$ 260,000
	Turbine - Determine the unit-specific feasibility and cost of converting one or more of HECO's reheat, baseload units to cycling duty and its impact on maintenance scope/schedules.	NE- O&M / Acct 546 / Oth Pwr Oper	Power Plant Engineering Division (PYM)	\$ 10,000	\$ 50,000	\$ 50,000	\$ 110,000
	Generator - Determine the unit-specific feasibility and cost of converting one or more of HECO's reheat, baseload units to cycling duty and its impact on AVR settings and generator maintenance scope/schedules.	NE- O&M / Acct 546 / Oth Pwr Oper	Power Plant Engineering Division (PYM)	\$ 10,000	\$ 50,000	\$ 50,000	\$ 110,000
	Balance of Plant - Determine the feasibility and cost of converting one or more of HECO's reheat, baseload units to cycling duty and its impact on maintenance scope/schedules.	NE- O&M / Acct 546 / Oth Pwr Oper	Power Plant Engineering Division (PYM)	\$ 10,000	\$ 150,000	\$ 100,000	\$ 260,000
	Subtotal Power Supply Engineering Dept			\$ 40,000	\$ 400,000	\$ 300,000	\$ 740,000

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Hawaiian Electric Company, Inc.

2009 Test Year

Cost Estimates for Outside Services to Support Implementation Studies (in dollars)

	Outside Services Scope	Cost Class	Division Budget	2008	2009	2010	Total
System Operation Dept.	Determine the operational impact of such as large-scale variable wind generation on dispatch and disturbance scenarios, degree of SCADA application on Oahu (Reference Outage Report), Dispatcher training/staffing requirements, and scope of what needs to be changed including operating policies and procedures.	NE- O&M / Acct 546 Oth Pwr Oper	Operating Division (PRD)	\$ -	\$ 200,000	\$ -	\$ 200,000
	Subtotal System Operation Dept			\$ -	\$ 200,000	\$ -	\$ 200,000
Power Supply Services Dept.	Determine timing and impact on overall fuel procurement based on large-scale variable wind generation resources serving Oahu.	NE-FUEL / Acct 501 Fuel	Fuels Resources Division (PIF)	\$ -	\$ -	\$ 50,000	\$ 50,000
	Subtotal Power Supply Services Dept			\$ -	\$ -	\$ 50,000	\$ 50,000
Environmental Dept.	Based on the impacts of large-scale variable wind generation resources, determine any environmental impacts such as modification of covered source permits to reflect changes in reheat unit design, operation and maintenance.	NE- O&M / Acct 546 Oth Pwr Maint	Air Quality / Noise Division (PJB)	\$ 20,000	\$ 20,000	\$ 20,000	\$ 60,000
	Subtotal Environmental Dept			\$ 20,000	\$ 20,000	\$ 20,000	\$ 60,000
Energy Solutions	R&D Oahu Wind Study (GE Study) - Develop a GE PSFL/MAPS validated model of the HECO system.	NE-R&D / 9302, (A&G) Misc Gen	VP Energy Solutions (P9S)	\$ 72,000	\$ 677,000		\$ 749,000
	Subtotal Energy Solutions Dept			\$ 72,000	\$ 677,000		\$ 749,000
PSO&M	Consulting and outside service expenses to characterize and improve the dynamic response of generating units.	NE- O&M / Acct 546 Oth Pwr Maint	PSO&M (PIB)	\$ 200,000	\$ 700,000	\$ 400,000	\$ 1,300,000
	Subtotal PSO&M Dept			\$ 200,000	\$ 700,000	\$ 400,000	\$ 1,300,000
	Total			\$ 412,000	\$ 2,897,000	\$ 970,000	\$ 4,279,000

HECO Generation Cycling Study

Request for Proposals

Background: In the near future it is anticipated that large blocks of power generation from non-utility sources would be integrated in the HECO system. In order to accommodate this additional power, it is anticipated that it would be necessary to daily cycle (on and off) one or more of the reheat units on the HECO system. The reheat units being considered for cycling are Kahe units 1, 2, 3, 4 and Waiau units 7 and 8.

Study Objectives: Identify HECO's reheat units' (Kahe 1, 2, 3, 4 and Waiau 7 and 8) existing system and equipment that would be impacted by cycling operation. Determine system or equipment modifications recommended to allow or improve the units' cycling capability. Develop conceptual work scopes, cost estimates and schedules for implementation. Recommendations should include modifications needed to ensure the continued longevity and reliability of HECO's generating assets.

Familiarization with the HECO system:

The consultant shall visit the units to perform surveys to determine the installed designs and configurations in order to identify the areas requiring cycling considerations.

- Facility locations and manning/staffing.
- Equipment types, manufacturers, ratings.
- Technical documentation.
- Controls hardware, governors, firing systems.
- Controls programming.
- Nameplate data and actual capability.
- Outage/Overhaul Planning.
- Critical equipment and condition.

Review of previous studies:

- Cycling studies were previously conducted for Kahe units 5 and 6 by Stone & Webster in 1986 and are available for review.
- EPRI literature.
- Other utilities?

Identification of limitations, and proposed modifications:

HECO will schedule unit cycling tests for the consultant to determine the unit's capability to cycle. The consultant shall develop the field performance test protocol and HECO would perform the testing and record the needed parameters for the consultant's review.

Items of concern to include but are not limited to:

- Variations in turbine first stage steam temperature--turbine life.
- Transient differences between SH and RH temperatures--turbine life.
- Attemperator spray performance evaluation--response, stresses.
- Effects on maximum allowed rate of load change--response/performance.
- Stresses on boiler components--boiler life.
- Effects of feedwater heaters out of service--turbine life.
- Drum level control response to shrink/swell--response, boiler and turbine safety.
- Water induction protection--turbine safety.
- Make-up boiler water – storage and production capacities

Cost impacts:

- Capital cost estimates for system and equipment modifications.
- Conceptual implementation schedule.
- Estimated impact on future O&M efforts.
- Estimated change to reliability (more frequent unplanned outages, even after implementing the equipment modifications?)

Schedule: The desired start for this study is December 2008 with a completion by June 2009.

WORK AUTHORIZATION NO. PYT-08-004-01-01
Contract No. MSTR-PYA-07-025

I. Request for Quote

Under the terms and conditions of the Consultant Services Master Agreement, dated January 25, 2008, by and between **Electric Power Systems, Inc.** ("Consultant") and **Hawaiian Electric Company, Inc.** ("Company"), Company hereby requests a proposal from Consultant to perform the following Work:

Perform the HECO Large Wind Integration System Stability and Interconnection Study. The study shall be conducted per the attached proposal from EPS titled Hawaiian Electric Company, Inc., Large Wind Integration Stability and Interconnection Study, Dated October 10, 2008.

This Work Authorization corrects the date of Consultant Services Master Agreement number MSTR-PYA-07-25 from March 1, 2006 referenced in the original Work Authorization, executed on October 16, 2008, to the correct date of January 25, 2008.

Dated: November 10, 2008

Hawaiian Electric Company, Inc.
Company

The minimum insurance limits and warranty defect discovery period specified in the Consultant Services Master Agreement shall be modified for this Work Authorization only:

Warranty

Section 7.3 - _____ year discovery period for defects

Employers' Liability

Section 8.1 - \$_____ per each accident
\$_____ for bodily injury from disease -
each employee
\$_____ for bodily injury from disease -
each policy limit

Commercial General Liability

Section 8.2 - \$_____ per occurrence
\$_____ general aggregate

Automobile Liability

Section 8.3 - \$_____ per accident

Professional Errors and Omissions

Section 8.4 - \$_____ per each claim
\$_____ per aggregate

Pollution Liability and/or Asbestos Abatement Liability and/or
Lead Abatement Liability

Section 8.5 - \$_____ per occurrence

Marine

Section 8.6 - \$_____ per occurrence

II. Consultant's Proposal

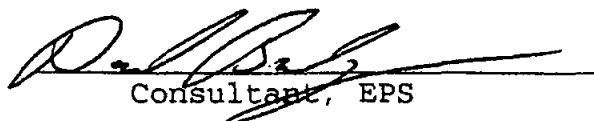
Consultant hereby proposes to perform the Work described above in Section I, under said terms and conditions, for the following amount:

Total not-to-exceed cost is \$75,860.00.

Work will begin immediately upon a notice to proceed and receipt of the data in the scope of work. The work will be completed 11 week from the notice to proceed.

Jim Cote will act as Consultant's Designated Representative during the performance of this Work.

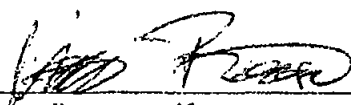
Dated: 11-11-08


Consultant, EPS

III. Work Authorization

Consultant's foregoing Proposal is accepted. Consultant is authorized to perform the Work as proposed. Company's Designated Representative for this Work Authorization shall be Marc Matsuura, Director, Transmission Planning Division.

Dated: 11/12/08



Leon Roose, Manager
System Planning
Hawaiian Electric Co. Inc.



Hawaiian Electric Company, Inc.
Large Wind Integration System Stability
&
Interconnection Study
Scope of Work and Cost Estimate

October 10, 2008

Hawaiian Electric Company, Inc.
Wind Integration & Interconnection Study

1 Background

Hawaiian Electric Company, Inc. (HECO) is requesting a scope of work and cost estimate from Electric Power Systems, Inc. (EPS) to determine the maximum penetration rate for wind or other forms of renewable energy on the HECO system. The review will include an analysis of issues of frequency regulation, system stability, and voltage performance of the system before and after the addition of renewable generation resources, in particular, wind resources.

The study will determine the current allowable penetration of renewable generation on the Oahu system from a transient stability standpoint and will identify general interconnection and requirements of the total renewable pool such that acceptable system performance is maintained, while maximizing the amount of renewable generation that can be connected to the system on Oahu.

2 Scope of Work

The Scope of Work for the study is defined in separate work sections below.

2.1 Review of Existing System Performance

EPS will review the existing HECO power flow and transient stability model for the Oahu system. We will develop maximum and minimum load cases and intermediate cases as required, reflecting current operating practices and dispatch scenarios.

EPS will conduct power flow and transient stability simulations for the existing system to benchmark the existing performance of the system for several contingencies, including typical and severe line outages, unit trips and other criteria listed in the HECO planning criteria. We will benchmark the model against available recordings of actual system response to disturbances.

To complete this phase of the project, EPS will require system disturbance data from HECO that provides 30 second transient recordings of a known system disturbance, such as a generator trip, the load at the time of the disturbance and the generation dispatch at the time of the disturbance.

2.2 System Stability Impact of Wind

EPS will evaluate the impact of adding the maximum amount of wind generation to the HECO system. Wind will be added to the three load cases at locations identified by HECO. Fossil fired generation will be taken off-line in the de-commitment order supplied by HECO as additional wind generation is added to determine the point at which system stability performance is degraded beyond acceptable levels, based on HECO operating and planning criteria.

EPS will identify the penetration level beyond which any additional wind generation will need to be installed with supplemental controls or devices such as energy storage systems, in order to maintain acceptable system stability.

2.3 Steady-State Power Flows

Assuming the interconnection of wind farms on the island and large off-shore wind farms, EPS will evaluate the impact of the total renewable power pool on steady-state power flows on the HECO system to determine the impacts of the total renewable energy pool.

Hawaiian Electric Company, Inc.
Wind Integration & Interconnection Study

2.4 Documentation

EPS will provide documentation for each phase of this study. The documentation will include electronic files for any modifications to the PSS/E database, stability simulation results, and discussion of all assumptions and conclusions.

The final report will include a report outlining the maximum allowable amount of renewable generation that can be added to the HECO system without impacting system performance. The maximum allowable renewable generation amount will include generation levels at minimum and peak load conditions. In addition, the report will outline what types of energy or control devices are required by the renewable energy pool as a whole to maintain acceptable operating conditions, while maintaining maximum levels of renewable energy output.

2.5 Ride-Through

EPS will develop ride-through requirements for the total renewable energy pool in terms of over/undervoltage and over/under frequency requirements and fault ride through requirements of the total renewable energy pool.

2.6 Renewable Data Requirements

EPS will develop data requirements required by all renewable energy producers prior to the initiation of interconnection studies. The data requirements will be in tabular and block diagram forms to ensure that all data required for the study of the HECO system is obtained and the HECO PSS/E database is updated following the completion of the project.

2.7 Voltage Transients

EPS will review the expected voltage transients under the maximum possible renewable pool conditions and develop lightning and breaker ratings and requirements for these conditions.

2.8 Critical Clearing Time

EPS will determine the critical clearing time for key lines within the HECO system under maximum renewable pool conditions.

2.9 Interconnection One-Line

EPS will develop a typical one-line of the proposed interconnection with the wind project developers outlining the protective relaying, breakers, potential transformers, recorders, and meters required for the interconnection.

2.10 Interim Reports

Due to the nature of this project, EPS expects there will be several interim or draft reports that are used in developing the final interconnection study for this project. EPS will issue all draft reports and incorporate HECO comments into subsequent drafts or the final report.

Hawaiian Electric Company, Inc.
Wind Integration & Interconnection Study

3 Cost Estimate and Schedule

A proposed schedule along with cost estimates is included in Table 1 below.

Table 1 – Cost and Schedule

Task	Description	Weeks to Complete	Hrs	Cost
Existing System Review	Review of existing system and PSS/E database	1	160	\$ 21,440.00
Stability Impact of Wind	Determine maximum wind penetration based on system stability constraints	3	120	\$ 16,080.00
Power Flows	Determine Steady-State power flows	1	40	\$ 5,360.00
One-Line	Develop Interconnection one line	1	30	\$ 4,020.00
Ride Through Requirements	Develop ride through requirements for HECO system	1	40	\$ 5,360.00
Data Requirements	Develop data submittal requirements	0.5	8	\$ 1,072.00
Voltage Transients	Review HECO breaker and lightning arrester requirements	0.5	12	\$ 1,608.00
Critical Clearing Time	Develop Critical Clearing Time for key transmission lines	2	40	\$ 5,360.00
Cost Estimates	Integrate Cost Estimates into report	1	10	\$ 1,340.00
Reports	Interim & Final Reports		80	\$ 10,720.00
Expenses	Airfare, Hotel			\$ 3,500.00
	Totals	11	540	\$ 75,860.00

Hawaiian Electric Company, Inc.
2009 Test Year
Rate Case Update
HECO Green House Gas Non-Labor Expense Distribution
RA: PJB

Item	Estimated Total Cost	HECO Portion (60% of total)	MECO Portion (20% of total)	HELCO Portion (20% of total)
Green House Gas Non-Labor	\$75,000	\$45,000	\$15,000	\$15,000

HAWAIIAN ELECTRIC COMPANY, INC.
2009 RATE CASE - Power Supply Process Area
Added Positions - Calc Labor and Non-Labor Cost

	<u>Lab</u> <u>Class</u>	<u>Std Rt +</u> <u>NPW (1)</u>	<u>Productive Hours</u>			<u>HECO</u> <u>Cost</u>
			<u>HECO</u>	<u>HELCO</u>	<u>MECO</u>	
<u>System Planning Dept. - Renewable Energy Planning Div. (RA: PXP)</u>						
<u>Labor-</u>						
1- Director - Renewable Energy Planning (hire 3-09)	FS-I	\$52.27	806	403	403	\$42,130
1- Senior Renewable Energy Engineer (hire 4-09)	TCS-I	\$50.41	725	363	363	\$36,547
1- Renewable Energy Engineer (hire 12-08)	PPENGR	\$38.86	982	491	491	\$38,161
1- Renewable Energy Engineer (hire 3-09)	PPENGR	\$38.86	818	409	409	\$31,787
Subtotal- Labor						<u>\$148,625</u>
<u>Non-Labor-</u>						
Materials / Supplies						\$1,000
Outside Consulting Services						\$100,000
Mainland Travel / Meals						\$4,350
Subtotal- Non-Labor						<u>\$105,350</u>
Total - System Planning - Renewable Energy Planning						<u>\$253,975</u>
<u>Power Supply Services Dept. - Renewable Energy Power Purchase Div. (RA: PIU) (2)</u>						
<u>Labor-</u>						
1- Director - Renewable Energy Power Purchase (hire 1-09)	FS-I	\$52.27	1,599	36	24	\$83,580
1- Contract Negotiator (hire 3-09)	TC-I	\$44.16	1,743	0	0	\$76,971
Subtotal- Labor						<u>\$160,551</u>
<u>Non-Labor-</u>						
Materials / Supplies						\$1,500
Outside Consulting and Legal Services						\$140,400
Mainland Travel / Meals						\$1,800
Subtotal- Non-Labor						<u>\$143,700</u>
Total - Power Supply Services - Renewable Energy Power Purchase						<u>\$304,251</u>

Notes:

- (1) Standard labor rates are per the standard rates applied in Rate Case Test Year 2009. Added to the standard labor rates is \$5/hr for Non-Productive Wages, EE421.
- (2) Some of the functions/responsibilities of the existing Power Purchase Div will become the responsibilities of the new Renewable Energy Power Purchase Div. Therefore, the hours and costs represent the net increase between the two divisions.

HAWAIIAN ELECTRIC COMPANY, INC.

2009 Test Year

RATE CASE UPDATE

Reorganization -

Power Supply Services Department

New Division: Renewable Energy Power Purchase (RA: PIU)

The purpose of this schedule is to reflect the net increase in labor hours and non-labor expenses after the Reorganization.

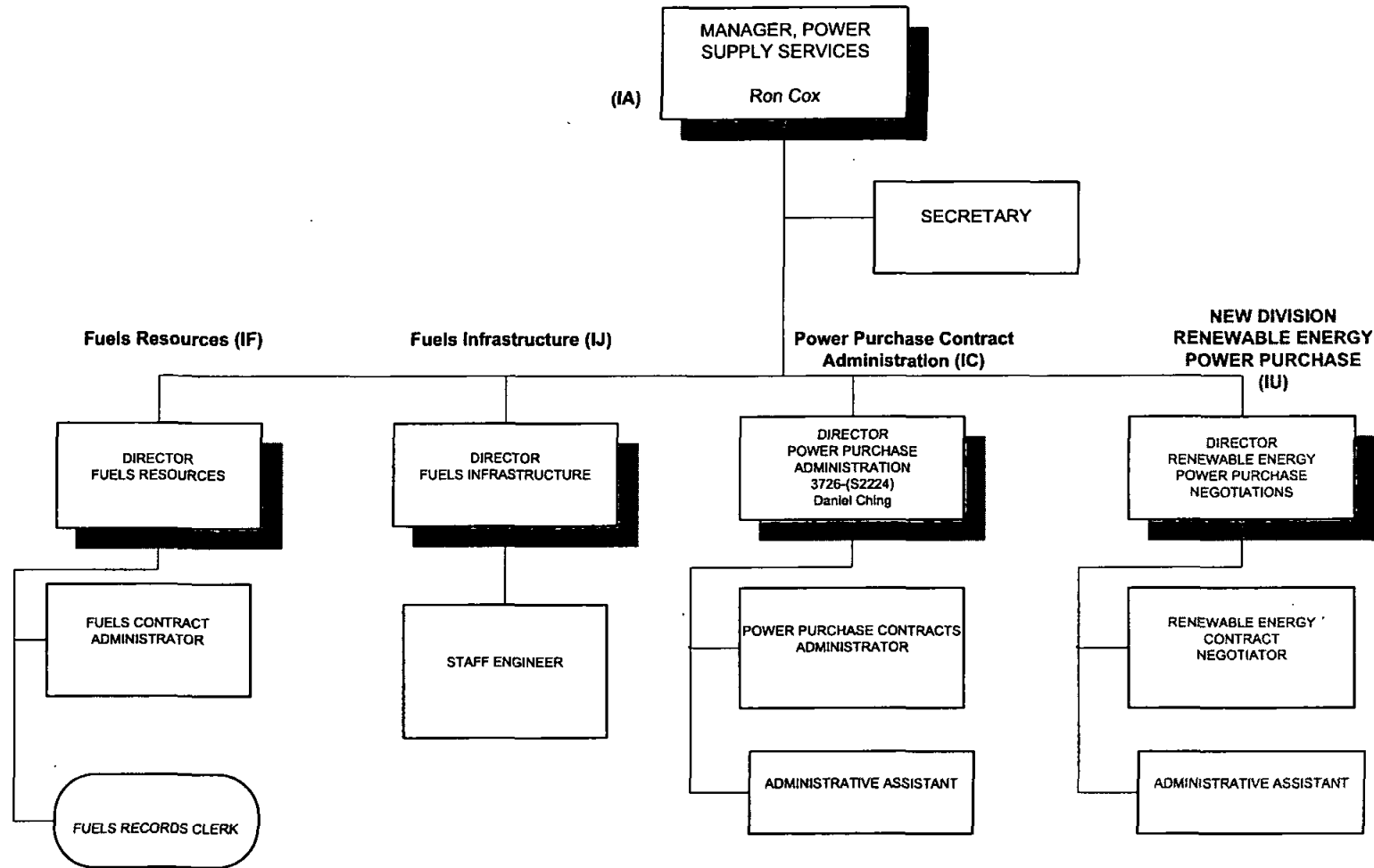
	As Filed Power Purchase (RA: PIC) Productive Hours			Reorg Power Purchase (RA: PIC) Productive Hours			Reorg Renew Energy Power Purchase (RA: PIU) Productive Hours			Reorg Labor Total (RA PIC and PIU) Productive Hours			Net Increase - Staff Hours Productive Hours		
	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO
Director (1 to 2)	1,624	174	116	1,731	36	24	1,492	174	116	3,223	210	140	1,599	36	24
Contract Adm/Neg (3 to 4)	4,038	640	696	3,491	120	120	2,638	519	576	6,129	639	696	2,091 (A)	(1)	0
Admin Assistant (2 to 2)	3,468	71	71	1,784	24	36	1,677	72	60	3,461	96	96	(7) (B)	25	25
	9,130	885	883	7,006	180	180	5,807	765	752	12,813	945	932	3,683	60	49

	As Filed - Power Purchase Non-Labor Cost			Reorg - Power Purchase Non-Labor Cost			Reorg - Renew Energy Power Pu Non-Labor Cost			Reorg - Non-Labor Total			Net Increase Non-Labor Cost		
	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO	HECO	HELCO	MECO
Materials / Supplies	\$1,500	\$0	\$0	\$1,500	\$0	\$0	\$1,500	\$0	\$0	\$3,000	\$0	\$0	\$1,500	\$0	\$0
Outside Services	\$277,900	\$0	\$0	\$125,490	\$0	\$0	\$292,810	\$0	\$0	\$418,300	\$0	\$0	\$140,400	\$0	\$0
Mainland Travel / Meals	\$1,750	\$1,000	\$1,000	\$1,750	\$0	\$0	\$1,800	\$1,000	\$1,000	\$3,550	\$1,000	\$1,000	\$1,800	\$0	\$0
	\$281,150	\$1,000	\$1,000	\$128,740	\$0	\$0	\$296,110	\$1,000	\$1,000	\$424,850	\$1,000	\$1,000	\$143,700	\$0	\$0

(A) - Renewable Energy Power Supply Negotiator to be hired in March 2009. As calculated 2009 productive hours is 1,743 (2,091 * 10/12)

(B) - Admin Assistant - HECO productive hours net change not material. No adjustment made.

POWER SUPPLY SERVICES



HAWAIIAN ELECTRIC COMPANY
MERT
POSITION DESCRIPTION

Position Title: Director, Renewable Energy Power Purchase Negotiation
Department: Power Supply Services
Reports to: Manager, Power Supply Services

Job Code: S2642

Role: FS

FLSA: E

Date: 10/09/08

Primary Role/Function

Manages, coordinates, and directs the activities of the Renewable Energy Power Purchase Division of the Power Supply Services Department. Manages the negotiation of all renewable energy power purchase agreements for HECO, HELCO, MECO and/or policies with Independent Power Producers, Cogenerators, and Qualifying Facilities for HECO and its two subsidiaries, MECO and HELCO.

Conceives, plans, and implements specific projects and activities in support of overall corporate programs. Recommends facilities, personnel, and funds required to carry out programs which are directly related with, and directed toward, fulfillment of overall organization objectives. Initiates and maintains contacts with key engineers, lawyers, accountants and officials inside/outside of the company in the interest of joint problem solving, coordination, and keeping up with technical, social, political, legal, and regulatory developments. Makes recommendations on sophisticated technical issues which require the integration of knowledge and expertise in all areas of power system planning, design, and operations.

Job Responsibilities

- *60% Conceives, plans, develops, coordinates, and directs the acquisition of renewable energy resources through power purchase contract negotiations. Coaches and mentors the Power Purchase negotiation team leaders. Provides external and internal planning and communications strategy development and leadership related to renewable energy power purchase contract negotiation issues and process. Evaluates reviews and approves large complex or critical power purchase agreements and/or policies with Independent Power Producers, Cogenerators, and Qualifying Facilities for HECO and its subsidiaries. Serves as expert advisor to senior management and primary negotiator on renewable energy power purchase agreement issues, including technical and financial models and analysis. Must remain current in the latest trends in emerging technologies.
- *10% Creates, develops, directs, and/or delivers planning/engineering-type expert testimony, responses to information requests, presentations, and other assignments supporting power purchase agreements before various external agencies such as the Hawaii Public Utilities Commission (PUC), the State Legislature, and Legal Arbitration cases. Directs formation of recommendations for capital budget items. Directs avoided costs computations, performance criteria studies, interconnection requirements studies, and recommends contract terms related to power contract proposals.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Power Purchase S2642

- *10% Serves as backup and resource to the Power Purchase Contract Administration (PPCA) Division for executed power purchase agreements between Independent Power Producers, Cogenerators, and Qualifying Facilities for HECO and its subsidiaries, MECO and HELCO. PPCA Division functions include: 1) Ensuring consistent interpretation, strict compliance, and proper administration of all power purchase agreements. 2) Justifying terms and conditions of power purchase agreements to include capacity charges, energy charges, penalties/incentives, and methodologies of payment. 3) Reviewing and approving all monthly payments in accordance with executed purchase power agreements. 4) Directing liaison activities with Independent Power Producers on operational matters during abnormal operating conditions.
- *20% Set priorities for the Renewable Energy Division. Develop, implement and administer policies and procedures to support Division's mission and departmental and corporate goals and strategies. Supervises and administers divisional personnel matters including performance appraisals, interviews, and employee guidance, recognition, and support. Ensures sufficient trained staff and resources are made available to effectively meet division, department, and corporate objectives. Provides technical assistance to other departments, subsidiaries, and consultants. Serves on major task forces and standing committees. Substitutes for Department Manager in his/her absence.

* Denotes a "Fundamental Responsibility"

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Power Purchase S2642

Minimum Qualifications

Knowledge Requirements:

Extensive knowledge of engineering, and business principles and theories normally acquired through a college level curriculum resulting in a master's degree or equivalent experience. Strong accounting/finance and business law background desirable.

- Strong knowledge about current state/national/international market conditions, including financial models and accounting treatment, for renewable energy project development.
- Extensive knowledge of Renewable Energy technologies, both commercial and emerging, and their Utility scale applications. Technical and project development finance expertise combined with government incentives are desired.
- Extensive knowledge of electrical engineering principles with particular concentration in the power system analysis field normally acquired through a college level graduate curriculum or equivalent experience.
- Professional engineer registration highly preferred to allow development and/or delivery of planning/engineering expert testimony before the PUC.
- Extensive knowledge of generation resource planning methodologies including the integration of supply and demand-side resources. Understanding of transmission and protection considerations and constraints. Understanding of various renewable energy technologies and their relative advantages and disadvantages when integrating with utility grids.
- Extensive understanding of methods of avoided costs computations, and a thorough understanding of island-specific executed purchase power agreements between Independent Power Producers, Cogenerators, and Qualifying Facilities.
- Extensive knowledge of utility economic analysis and accounting methods including, but not limited to, derivation of financial parameters, calculation of revenue requirements, and the ability to perform various economic analyses.
- Extensive knowledge of PUC, environmental, and all other state and federal laws and regulations as related to integrated resource planning activities.
- Working knowledge of budgeting/forecast process.
- Working knowledge of personal computers and/or mainframe systems, and related software applications to include word processing, spreadsheets, presentations, and data bases.
- Thorough knowledge of policies and procedures contained in such documents as: Company/Union agreement, Accident Prevention Manual, General Information Manual, Code of Conduct, etc.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Power Purchase S2642

Minimum Qualifications (continued)

Skills Requirements

- Demonstrated supervisory/leadership skills including effective written, oral, listening, and presentation/platform communication skills/conflict resolution skills; the ability to use tact, courtesy, and discretion while working effectively with a variety of individuals, occasionally dealing with sensitive, difficult or confrontational issues; the willingness and ability to train. Strong negotiating, influencing, and persuading techniques.
- Demonstrated and creative negotiation skills in complex technical and financial renewable energy generation projects.
- Demonstrated extensive analytical and administrative skills required for such tasks as preparing, monitoring and analyzing forecasts; preparing performance appraisals and conducting interviews; carrying out company/department policies and procedures.
- Analytical, organizational, and conceptual skills to handle various complex ideas, projects, and programs.
- Demonstrated ability to remain flexible in a demanding work environment and adapt to rapidly changing priorities.
- Must have or be able to qualify for a State of Hawaii driver's license and HECO driver's license in order to travel to/from independent power producer sites.

Experience Requirements

- Minimum 10 years experience in power system planning, design, or operations, with a minimum 3 years experience in the operations area and a minimum of 3 years experience in evaluating and negotiating renewable energy power proposals preferred.
- Minimum 5 years experience in a supervisory position.

Requirements are representative of minimum levels of knowledge, skills, and abilities. To perform the position successfully, the incumbent will need to demonstrate the use of these knowledge, skills, and abilities at an "Effective" level.

Positions Supervised

<u>Title</u>	<u>Number Supervised</u>
Purchased Power Contracts Negotiator	2
Administrative Assistant	1

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Power Purchase S2642

Physical Requirements

Only items that are necessary to perform the "fundamental" responsibilities of the position are indicated.

"F" for Frequently:

Daily, several times a week, weekly

"O" for Occasionally:

Monthly, Couple times a year

<input type="radio"/> Standing	<input type="radio"/> Lifting/Carrying below 25 lbs.
<input type="radio"/> Walking	<input type="radio"/> 26 to 50 lbs.
<input type="radio"/> Sitting	<input type="radio"/> above 50 lbs.
<input type="radio"/> Climbing Ascending or descending ladders, stairs, or other objects.	<input type="radio"/> Vision acuity the ability to see clearly 20 feet or more
<input type="radio"/> Balancing on narrow, slippery, or erratically moving surfaces.	<input type="radio"/> Color vision the ability to identify and distinguish different colors.
<input type="radio"/> Stooping, kneeling, crouching, crawling, and/or squatting	<input type="radio"/> Night vision the ability to perform work at night with the use of portable lighting.
<input type="radio"/> Handling Working with hands, arms or fingers.	<input type="radio"/> Talking
<input type="radio"/> Feeling Perceiving attributes such as size, shape, temperature or texture.	<input type="radio"/> Hearing
<input type="radio"/> Ability to follow written/oral instructions	<input type="radio"/> Ability to perform simple, repetitive tasks for an extended period of time
	<input type="radio"/> Ability to perform complex and varied tasks for an extended period

Environmental Conditions

The employee will be exposed to the following environmental conditions in performing the "fundamental" responsibilities of the position.

<input type="radio"/> Extreme Cold cold temperatures for an hour or more	<input type="radio"/> Working Outdoors may be during prevailing weather/climate conditions
<input type="radio"/> Extreme Heat warm/hot temperatures for an hour or more	<input type="radio"/> Hazardous Conditions potentially life-threatening situations
<input type="radio"/> Wetness	<input type="radio"/> Work above 5 feet
<input type="radio"/> Use of personal protective equipment (hard hats, respirator, leather gloves, rubber glove, safety shoes, nomex clothing)	<input type="radio"/> Work above 70 feet
<input type="radio"/> Work in emergency/potentially "high stress" situations	<input type="radio"/> Work on mountain trails/cliff sides
<input type="radio"/> Noise At least 80 decibels	

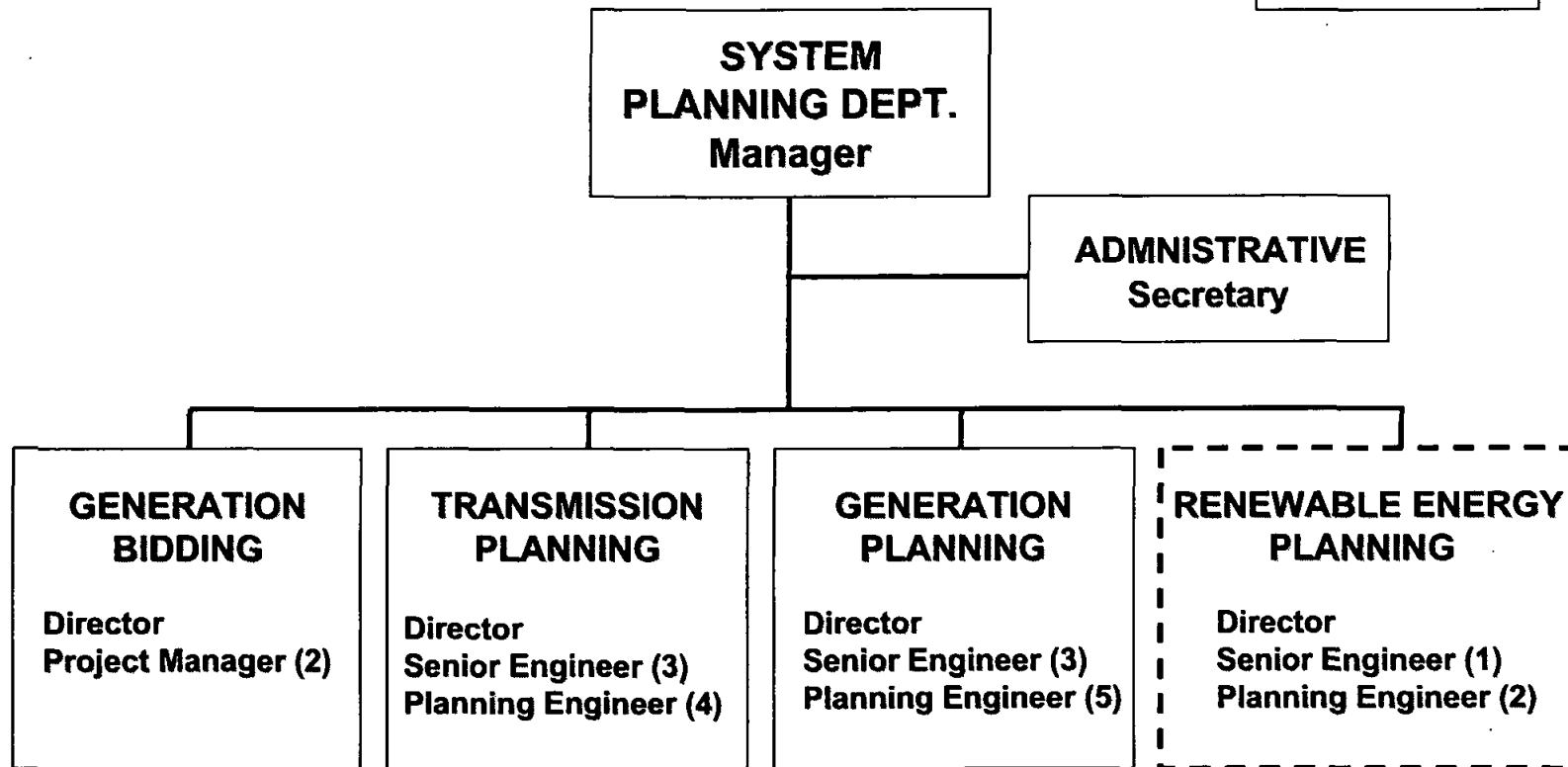
Job responsibilities are subject to possible modification to reasonably accommodate individuals with disabilities.

Some job requirements may exclude individuals who pose a direct threat or significant risk to the health and safety of themselves or other individuals.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

System Planning Department

Total Staff: 26



HAWAIIAN ELECTRIC COMPANY
MERIT
POSITION DESCRIPTION

Position Title: Director, Renewable Energy Planning
Department: System Planning
Reports to: Manager, System Planning

Job Code: S _____
Role: FS _____

FLSA: E _____
Date: 10/27/08 _____

Primary Role/Function

Manages, coordinates and directs the operations of the Renewable Energy Planning Division. Facilitates, through a matrix organization, the integration of renewable energy projects into the HECO, MECO and HELCO systems. Leads the development of appropriate strategies, methods, plans, and policies to achieve successful integration of renewable energy projects while sustaining reliable grid operation, including the development of project performance standards, interconnection requirements, and grid-side mitigation measures.

Job Responsibilities

- * 30% **Renewable Integration Assessment.** Conducts planning and implementation studies to integrate renewable sources in a manner that preserves the stability, reliability, and operability of the HECO, HELCO, and MECO systems. Provides technical leadership in managing and directing a wide range of in-house and external leveraged resources. Directs and coordinates the analyses and evaluation of the impact of new renewable energy projects on the utility systems. Collaborates with others on operational assessments of renewable projects on the utility grids, including the development of project performance standards, establishment of communication protocols, renewable start-up, testing and performance monitoring, and development and/or modification of system operating procedures and grid-side mitigation measures.
- * 30% **Interconnection Requirements and Power Purchase Contracts.** Directs the integration of renewable resources into the electrical grid, including the assessment of interconnection related issues such as the study of interconnection requirements and operational curtailment potential, to effectively advise senior management and utility negotiating team in developing related power purchase contract terms and strategy. Directly participates in power purchase contract negotiations with independent power producers (IPP), facilitating discussions with IPPs on the technical aspects of integrating renewable projects into the utility grids. Provides advice and utility overview of the IPP project design and construction process to assist in ensuring project compliance with interconnection requirements and power purchase agreement terms. Serves as a technical resource to support administration of power purchase contracts.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

- | | |
|-------|--|
| * 20% | Regulatory Support. Represents or provides the professional and technical leadership to formulate the position of HECO, MECO and HELCO on renewable energy system integration related issues before external agencies or groups such as, but not limited to, the Public Utilities Commission, the Consumer Advocate, IRP advisory groups, community or professional organizations, legislators, and other such parties or entities by presenting and providing data, documentation, responses to information requests, and/or written and oral testimony. |
| * 20% | Administrative. Administers Division's personnel matters including performance review and management, hiring and staffing, staff training and development, safety, and recognition of employee achievements. Prepares budgets and expense forecasts for the Renewable Energy Integration Division. |

* Denotes a "Fundamental Responsibility"

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

COMPENSATION DIVISION S:\PD\PDFORM (JUNE 1994)

Director, Renewable Energy Planning

Minimum Qualifications:

Knowledge Requirements:

- Bachelor of Science degree in Electrical Engineering or equivalent of the degree in appropriate education and experience required. Emphasis in the field of Power System Analysis is highly desirable.
- Working knowledge of methods of economic analysis, and principles of electrical engineering in the field of power system analysis including load flows, stability analysis, short circuit analysis, system protection, and production simulations.
- Working knowledge of personal computers and/or mainframe systems and related software applications such as spreadsheets, word processing, etc.
- Professional Engineer Registration in the State of Hawaii highly desirable to demonstrate competence and credibility in administrative or legal proceedings while representing HECO, MECO and HELCO as an expert witness, and to validate professional engineering status of engineers supervised. Registered Profession in Electrical Engineering is highly desirable.
- Thorough knowledge of the principles of utility rates and tariffs, PURPA, and general energy issues.
- Thorough knowledge of budgeting and forecasting process (including annual Operating Forecast; Capital Budgets; Inter-Company Billings; vehicle, equipment, tools, office furniture and equipment, etc.)
- Master of Business Administration or equivalent of the degree in appropriate education and experience is highly desirable.
- Basic understanding of generation resource planning methodology.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

COMPENSATION DIVISION S:\PD\PDFFORM (JUNE 1994)

Skills Requirements

- Supervisory /leadership skills including effective written, oral and listening communication skills; ability to work with a variety of individuals occasionally dealing with sensitive, difficult or confrontational issues using tact, courtesy and discretion.
- Analytical, organizational and conceptual skills to handle various projects and programs such as system studies and computer programs.
- Demonstrated extensive analytical and administrative skills required for such tasks as preparing, monitoring and analyzing forecasts; preparing performance appraisals and conducting interviews; carrying out company/department policies and procedures.
- Demonstrated ability to remain flexible in a demanding work environment and adapt to rapidly changing priorities.
- Excellent written, oral and presentation skills.
- Strong interpersonal skills to influence and persuade various groups or individuals.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Planning

Experience Requirements

Extensive (8+ years) experience in power system study, planning or operations.

Several (3-5) years of supervisory experience.

Requirements are representative of minimum levels of knowledge, skills, and abilities. To perform the position successfully, the incumbent will need to demonstrate the use of these knowledge, skills, and abilities at an "Effective" level.

Positions Supervised

<u>Title</u>	<u>Number Supervised</u>
Sr. Renewable Energy Engineer	1
Renewable Energy Engineer	2

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

Director, Renewable Energy Planning

Physical Requirements

Only items that are necessary to perform the "fundamental" responsibilities of the position are indicated.

"F" for Frequently: Daily, several times a week, weekly
"O" for Occasionally: Monthly, Couple times a year

F	Standing	F	Lifting/Carrying below 25 lbs.
F	Walking	O	26 to 50 lbs.
F	Sitting		above 50 lbs.
F	Climbing Ascending or descending ladders, stairs, or other objects.	F	Vision acuity the ability to see clearly 20 feet or more
	Balancing on narrow, slippery, or erratically moving surfaces.	F	Color vision the ability to identify and distinguish different colors.
O	Stooping, kneeling, crouching, crawling, and/or squatting		Night vision the ability to perform work at night with the use of portable lighting.
F	Handling Working with hands, arms or fingers.	F	Talking
F	Feeling Perceiving attributes such as size, shape, temperature or texture.	F	Hearing
F	Ability to follow written/oral instructions	F	Ability to perform simple, repetitive tasks for an extended period of time
		F	Ability to perform complex and varied tasks for an extended period

Environmental Conditions

The employee will be exposed to the following environmental conditions in performing the "fundamental" responsibilities of the position.

	Extreme Cold cold temperatures for an hour or more	O	Working Outdoors may be during prevailing weather/climate conditions
	Extreme Heat warm/hot temperatures for an hour or more		Hazardous Conditions potentially life-threatening situations
	Wetness	O	Work above 5 feet
O	Use of personal protective equipment (hard hats, respirator, leather gloves, rubber glove, safety shoes, nomex clothing)		Work above 70 feet
F	Work in emergency/potentially "high stress" situations		Work on mountain trails/cliff sides
	Noise At least 80 decibels		

Job responsibilities are subject to possible modification to reasonably accommodate individuals with disabilities.

Some job requirements may exclude individuals who pose a direct threat or significant risk to the health and safety of themselves or other individuals.

This position description in no way states or implies that these are the only duties/functions to be performed by the incumbent. Employee will be required to follow any other job-related duties/functions assigned by the supervisor

HAWAIIAN ELECTRIC COMPANY
MERIT
POSITION DESCRIPTION

Position Title: Senior Renewable Energy Engineer
Department: System Planning
Reports to: Director, Renewable Energy Planning

Job Code:
Role: T

FLSA: P
Date: 10-27-08

Primary Role/Function

Under the general direction of the Director, Renewable Energy Planning, leads and implements the objectives of the Renewable Energy Planning Division. Directs technical teams, through a matrix organization, to coordinate the integration of renewable energy projects into the HECO, MECO and HELCO systems. Assists the Director with the development of appropriate strategies, methods, plans, and policies to achieve successful integration of renewable energy projects while sustaining reliable grid operation, including the development of project performance standards, interconnection requirements, and grid-side mitigation measures.

Job Responsibilities

- * 30% **Renewable Integration Assessment.** Leads technical planning and implementation studies to integrate renewable sources in a manner that preserves the stability, reliability, and operability of the HECO, HELCO, and MECO systems. Coordinates the analyses and evaluation of the impact of new renewable energy projects on the utility systems. Coordinates the efforts of team to consider operational assessments of renewable projects on the utility grids, including the development of project performance standards, establishment of communication protocols, renewable start-up, testing and performance monitoring, and development and/or modification of system operating procedures and grid-side mitigation measures.
- * 30% **Interconnection Requirements and Power Purchase Contracts.** Leads the assessment of technical interconnection related issues such as the study of interconnection requirements and operational curtailment potential, to effectively advise the utility negotiating team in developing related power purchase contract terms. Provides support to power purchase contract negotiations with independent power producers (IPP) to advise on the technical aspects of integrating renewable projects into the utility grids. Develops advice and utility overview of the IPP project design and construction process to assist in ensuring project compliance with interconnection requirements and power purchase agreement terms. Provides technical resource to support administration of power purchase contracts.

Sr. Renewable Energy Engineer

*	20%	Regulatory Support. Provides lead technical support towards the development of the Company's position on renewable energy system integration related issues before external agencies or groups such as, but not limited to, the Public Utilities Commission, the Consumer Advocate, IRP advisory groups, community or professional organizations, legislators, and other such parties or entities.
*	10%	Administrative. Provides technical oversight and review of Renewable Energy Engineer's work products. Provides training and assistance with technical development of engineering staff.
*	10%	Budget and Forecasting. Provides input to the development of budgets and expense forecasts for the Renewable Energy Integration Division. Monitors budgets and expenses.

* Denotes a "Fundamental Responsibility"

Sr. Renewable Energy Engineer

Minimum Qualifications

Knowledge Requirements:

- Bachelor of Science degree in Electrical Engineering or equivalent of the degree in appropriate education and experience required. Emphasis in the field of Power System Analysis is highly desirable.
- Working knowledge of methods of economic analysis, and principles of electrical engineering in the field of power system analysis including load flows, stability analysis, short circuit analysis, system protection, and production simulations.
- Working knowledge of personal computers and/or mainframe systems and related software applications such as spreadsheets, word processing, etc.
- Professional Engineer Registration in the State of Hawaii highly desirable to demonstrate competence and credibility in administrative or legal proceedings while representing HECO, MECO and HELCO as an expert witness, and to validate professional engineering status of engineers supervised. Registered Profession in Electrical Engineering is highly desirable.
- Thorough knowledge of the principles of utility rates and tariffs, PURPA, and general energy issues.
- Basic understanding of generation resource planning methodology.

Skills Requirements

- Leadership skills including effective written, oral and listening communication skills; ability to work with a variety of individuals occasionally dealing with sensitive, difficult or confrontational issues using tact, courtesy and discretion.
- Analytical, organizational and conceptual skills to handle various projects and programs such as system studies and computer programs. Knowledge of load flow and stability programs.
- Demonstrated extensive analytical and administrative skills required for reviewing the work products of engineering staff, ability to train and assist with the technical development of staff, and carrying out company/department policies and procedures.
- Demonstrated ability to remain flexible in a demanding work environment and adapt to rapidly changing priorities.
- Excellent written, oral and presentation skills.

Sr. Renewable Energy Engineer

Experience Requirements

Extensive (5+ years) experience in power systems planning, design or operations.

Experience as Project Team Lead on major technical project that encompassed multiple technical and other support related disciplines.

Prior supervisory experience highly desirable.

Requirements are representative of minimum levels of knowledge, skills, and abilities. To perform the position successfully, the incumbent will need to demonstrate the use of these knowledge, skills, and abilities at an "Effective" level.

Positions Supervised

None.

Sr. Renewable Energy Engineer

Physical Requirements

Only items that are necessary to perform the "fundamental" responsibilities of the position are indicated.

"F" for Frequently: Daily, several times a week, weekly

"O" for Occasionally: Monthly, Couple times a year

F	Standing	F	Lifting/Carrying below 25 lbs.
F	Walking	O	26 to 50 lbs.
F	Sitting		above 50 lbs.
F	Climbing Ascending or descending ladders, stairs, or other objects.	F	Vision acuity the ability to see clearly 20 feet or more
	Balancing on narrow, slippery, or erratically moving surfaces.	F	Color vision the ability to identify and distinguish different colors.
O	Stooping, kneeling, crouching, crawling, and/or squatting		Night vision the ability to perform work at night with the use of portable lighting.
F	Handling Working with hands, arms or fingers.	F	Talking
F	Feeling Perceiving attributes such as size, shape, temperature or texture.	F	Hearing
F	Ability to follow written/oral instructions	F	Ability to perform simple, repetitive tasks for an extended period of time
		F	Ability to perform complex and varied tasks for an extended period

Environmental Conditions

The employee will be exposed to the following environmental conditions in performing the "fundamental" responsibilities of the position.

	Extreme Cold cold temperatures for an hour or more	O	Working Outdoors may be during prevailing weather/climate conditions
	Extreme Heat warm/hot temperatures for an hour or more		Hazardous Conditions potentially life-threatening situations
	Wetness	O	Work above 5 feet
O	Use of personal protective equipment (hard hats, respirator, leather gloves, rubber glove, safety shoes, nomex clothing)		Work above 70 feet
F	Work in emergency/potentially "high stress" situations		Work on mountain trails/cliff sides
	Noise At least 80 decibels		

Job responsibilities are subject to possible modification to reasonably accommodate individuals with disabilities.

Some job requirements may exclude individuals who pose a direct threat or significant risk to the health and safety of themselves or other individuals

HAWAIIAN ELECTRIC COMPANY
MERIT
POSITION DESCRIPTION

Position Title: Renewable Energy Engineer
Department: System Planning
Reports to: Director, Renewable Energy Planning

Job Code:

Role:

FLSA:

Date:

Primary Role/Function

Under the guidance of the Director, Renewable Energy Planning, and the Senior Renewable Energy Engineer, implements the objectives of the Renewable Energy Planning Division. Provides technical expertise to technical teams to coordinate the integration of renewable energy projects into the HECO, MECO and HELCO systems. Assists the Senior Renewable Energy Engineer with the development of appropriate strategies, methods, plans, and policies to achieve successful integration of renewable energy projects while sustaining reliable grid operation, including the development of project performance standards, interconnection requirements, and grid-side mitigation measures.

Job Responsibilities

- * 30% **Renewable Integration Assessment.** Provides technical expertise to the planning and implementation studies to integrate renewable sources in a manner that preserves the stability, reliability, and operability of the HECO, HELCO, and MECO systems. Develops the analyses and evaluation of the impact of new renewable energy projects on the utility systems. Provides technical expertise to the efforts of the team to consider operational assessments of renewable projects on the utility grids, including the development of project performance standards, establishment of communication protocols, renewable start-up, testing and performance monitoring, and development and/or modification of system operating procedures and grid-side mitigation measures.
- * 30% **Interconnection Requirements and Power Purchase Contracts.** Provides technical expertise to the assessment of technical interconnection related issues such as the study of interconnection requirements and operational curtailment potential, to assist the utility negotiating team in developing related power purchase contract terms. Provides technical support to power purchase contract negotiations with independent power producers (IPP) to advise on the technical aspects of integrating renewable projects into the utility grids. Works with Senior Engineer to develop advice and utility overview of the IPP project design and construction process to assist in ensuring project compliance with interconnection requirements and power purchase agreement terms. Provides technical resource to support administration of power purchase contracts.

Renewable Energy Engineer

*	20%	Regulatory Support. Provides technical support towards the development of the Company's position on renewable energy system integration related issues. May be called upon to assist Senior Engineer or Director with developing presentations or briefing materials before external agencies or groups such as, but not limited to, the Public Utilities Commission, the Consumer Advocate, IRP advisory groups, community or professional organizations, legislators, and other such parties or entities.
*	10%	Administrative. Provides regular written updates on projects and work assigned. Prepare internal and external correspondence as necessary.
*	10%	Budget and Forecasting. Monitors budgets and expenses.

* Denotes a "Fundamental Responsibility"

Renewable Energy Engineer

Minimum Qualifications

Knowledge Requirements:

- Bachelor of Science degree in Electrical Engineering or equivalent of the degree in appropriate education and experience required. Emphasis in the field of Power System Analysis is highly desirable.
- Working knowledge of methods of economic analysis, and principles of electrical engineering in the field of power system analysis including load flows, stability analysis, short circuit analysis, system protection, and production simulations.
- Working knowledge of personal computers and/or mainframe systems and related software applications such as spreadsheets, word processing, etc.
- Professional Engineer Registration in the State of Hawaii for Electrical Engineering highly desirable.
- Thorough knowledge of the principles of utility rates and tariffs, PURPA, and general energy issues.
- Basic understanding of generation resource planning methodology.

Skills Requirements

- Effective written, oral and listening communication skills; ability to work with a variety of individuals and work teams occasionally dealing with sensitive, difficult or confrontational issues using tact, courtesy and discretion.
- Analytical, organizational and conceptual skills to handle various projects and programs such as system studies and computer programs. Working knowledge of load flow and stability programs.
- Demonstrated analytical and technical skills required for the implementation of company/department policies and procedures.
- Demonstrated ability to remain flexible in a demanding work environment and adapt to rapidly changing priorities.

Renewable Energy Engineer

Experience Requirements

Extensive (3+ years) experience in power systems planning, design or operations.

Experience as key technical contributor on major project that encompassed multiple technical and other support related disciplines.

Requirements are representative of minimum levels of knowledge, skills, and abilities. To perform the position successfully, the incumbent will need to demonstrate the use of these knowledge, skills, and abilities at an "Effective" level.

Positions Supervised

None.

Renewable Energy Engineer

Physical Requirements

Only items that are necessary to perform the "fundamental" responsibilities of the position are indicated.

"F" for Frequently:

Daily, several times a week, weekly

"O" for Occasionally:

Monthly, Couple times a year

F	Standing	F	Lifting/Carrying below 25 lbs.
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F	Ability to follow written/oral instructions	F	Ability to perform simple, repetitive tasks for an extended period of time
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Environmental Conditions

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	Extreme Heat warm/hot temperatures for an hour or more		Hazardous Conditions potentially life-threatening situations
	Wetness	O	Work above 5 feet
O	Use of personal protective equipment (hard hats, respirator, leather gloves, rubber glove, safety shoes, nomex clothing)		Work above 70 feet
F	Work in emergency/potentially "high stress" situations		Work on mountain trails/cliff sides
	Noise At least 80 decibels		

Job responsibilities are subject to possible modification to reasonably accommodate individuals with disabilities.

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HAWAIIAN ELECTRIC COMPANY, INC.
2009 Test Year
Added Position - Calc Productive Labor Expense
Photovoltaic Engineer

	<u>Lab Class</u>	<u>Std Rt + NPW (1)</u>	<u>Hours</u>	<u>Cost</u>
<u>Energy Projects Dept. (RA: PNG)</u>				
1- Photovoltaic Engineer - (Hire -7/09)				
<u>Productive Labor-</u>				
Production O&M Hours (Indicator = NE)	TC	\$39.70	840	\$33,348

Notes:

- (1) Standard labor rates are per the standard rates applied in Rate Case Test Year 2009.
Added to the standard labor rates is \$5/hr for Non-Productive Wages, EE421.

MAPS License Fees – End User License

(Effective January 1, 2008)

One year license option	Annual
Single Site	\$85,000
Multiple Sites	\$100,000

Three year license option	Year 1	Year 2	Year 3
Single Site	\$75,000	\$75,000	\$75,000
Multiple Sites	\$90,000	\$90,000	\$90,000
Early Cancellation	\$10,000	\$10,000	N/A

- An End User License grants the licensee the right to use the licensed program only for its own purposes and not for the benefit of a third party.
- Single Site license covers unlimited usage at one site. A second site license within the licensee's company, that does not qualify for the Multiple Sites license option, is available at a 50% discount.
- Multiple Sites refer to facilities of a licensee or its affiliates that function in a single industry segment and are engaged in similar applications of the software.
- Licensee may name a consultant, who has been retained by the licensee to run MAPS on the licensee's behalf, as a second site, for an additional fee of \$15,000 per year.
- License fee includes five days of support in Schenectady, New York, program maintenance and updates for each year of the license term.
- A two and a half day MAPS training session in the continental U.S. is available for \$10,000. Customer training outside of the continental U.S. will be quoted upon request.





MAPS™ Software - For Informed Economic Decisions

In the rapidly changing world of the electric power industry, one thing has remained constant - the need to accurately model the economic operation of the power system in order to make informed decisions. Whether your interest is in assessing the value of a portfolio of generating units or in identifying the transmission bottlenecks that most seriously constrain the economic operation of the system, you must capture the complex interaction between generation and transmission systems. GE Energy offers and supports the Multi Area Production Simulation Software program (MAPS), which provides the detailed modeling your business needs.

MAPS Modeling Detail

MAPS software integrates highly detailed representations of a system's load, generation, and transmission into a single simulation. This enables calculation of hourly production costs in light of the constraints imposed by the transmission system on the economic dispatch of generation.

Generation system data capabilities of MAPS include multi-step cost curves, unit cycling capabilities, emission characteristics, and market bids by unit loading block. The generation units, along with chronological hourly load profiles, are assigned to individual buses on the system.

The transmission system is modeled in terms of individual transmission lines, interfaces (which are groupings of lines), phase-angle regulators (PARs), and HVDC lines. Limits can be specified for the flow on the lines and interfaces and the operation of the PARs. MAPS software models voltage and stability considerations through operating nomograms that

define how these limits can change hourly as a function of loads, generation, and flows elsewhere on the system.

Hourly load profiles are adjusted to meet peak and energy forecasts input to the model on a monthly or annual basis. Information on hourly loads at each bus in the system is required for MAPS to accurately calculate electrical flows on the transmission system. This is specified by assigning one, or a combination of several hourly load profiles to each load bus. In addition to studying all of the hours in the year, MAPS can be used to study all the days in the year on a bi-hourly basis, or a typical week per month on an hourly or bi-hourly basis. With these modeling options, MAPS simulates the loads in chronological order and does not sort them into load duration curves.

Based on this detailed representation of the entire system, MAPS performs a security-constrained dispatch of the generation by monitoring transmission system flows under both normal and contingency conditions.

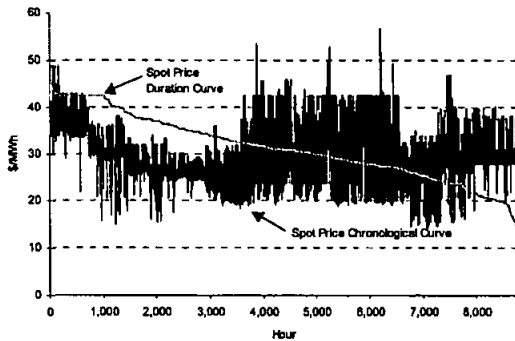
Data for Informed Decisions

Making the right choices in today's environment requires increasingly more detailed information about the operation of the system. In addition to traditional production costing quantities of unit generation and costs, MAPS also provides the following data:

- Calculations of hour-by-hour, nodal or bus spot prices of energy.
- Calculations of hourly line flows and congestion costs.

Generation	Transmission	Loads	Transactions
<ul style="list-style-type: none"> - Detailed Representation - Secure Dispatch 	<ul style="list-style-type: none"> - Tracks Individual Flows - Obeys Real Limits 	<ul style="list-style-type: none"> - Chronological by Bus - Varying Losses 	<ul style="list-style-type: none"> - Automatic Evaluation - Location Specific

MAPS Models the Bulk Power System



Unit Bus Spot Price of Energy

- Determinations of unit revenues based on MW output and bus spot prices.
- Computations of hourly emission quantities and removal and trading costs.
- Identification of companies and generators responsible for power flows on lines.

MAPS also ties to other software programs offered and supported by GE Energy, thus expanding its data analysis capabilities even further:

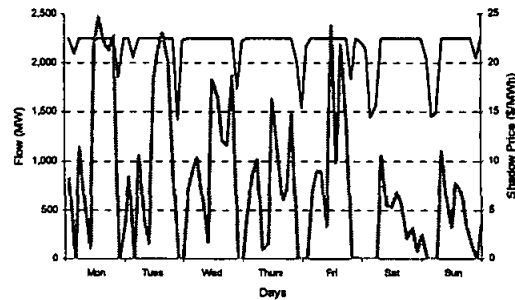
- MAPS ties to Positive Sequence Load Flow software (PSLF) to analyze the dispatch for a given hour for an accurate picture of voltage profile, var requirements, and system and area losses.
- MAPS ties to Multi Area Reliability Simulation software (MARS) to determine adequacy of installed capacity via Multi-Area Reliability Simulation.

MAPS Applications

Because of its detailed representation of generation and transmission systems, MAPS can be used to study a number of issues related to the deregulated utility market:

- The attributes of different proposed market structures and the development of pricing algorithms.
- The possibility of one or more market participant exerting market power.

- The value of a generation portfolio operating in a deregulated market.
- The location of transmission bottlenecks and associated congestion costs as well as transmission congestion contract (TCC) valuation.
- The impact on total system emissions that result from the addition of new generation.



Interface Flow and Shadow Price

Accurate Decisions Depend on Accurate Data

Your business depends on accurate modeling data for accurate decision-making. GE leverages more than 80 years of experience in analyzing the power industry's economics and equipment to provide you with the tools you need to run your business successfully. Contact the representative named below to find out more about how MAPS software and other services GE provides can help optimize your business strategies.

For more information on MAPS software contact

Devin T. Van Zandt

GE Energy

phone: 518-385-9066

email: devin.vanzandt@ge.com

<http://www.gepower.com/energyconsulting>

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BROC10320 (2/02)



imagination at work

Hawaiian Electric Company, Inc.
2009 Test Year

Update to CIP CT-1 Step:

The costs related to CIP CT-1 that were included in HECO-702 in direct testimony have been updated to reflect the Rate Case Update as follows and as shown in Attachment 14, page 3:

1. The partial year costs related to CIP CT-1 included in the 2009 test year estimate for Other Production O&M expenses decreased from \$1,489,000, as reported in HECO T-7 direct testimony to \$1,474,000 as shown in the Updated HECO-WP-709 provided as Attachment 14, page 5. The decrease of \$15,000 is due to the combined impacts of the Adjustment 12 (\$3,000 for CIP CT-1 Maintenance expense), and Adjustment 13 (\$12,000 for CIP CT-1 Operations expense) as described in Attachment 1.
2. The full year cost for CIP CT-1, had it operated from January 1 to December 31, 2009, decreased from \$2,598,000, as reported in HECO T-7 direct testimony to \$2,550,000, as shown in HECO-WP-709 Update (see Attachment 14, page 5). The \$48,000 reduction is the sum of the decrease of \$15,000 described above and an additional decrease of \$33,000 to properly adjust the emissions fee related to CIP CT-1 which was incorrectly omitted in the derivation of the full year cost of CIP CT-1 in direct testimony.
3. Other Production O&M expenses are adjusted in a series of steps, as summarized on Attachment 14, page 3 (which is an update of HECO-702) to account for the Interim Increase without CIP CT-1 and the full year operation of CIP CT-1:
 - a. Column (A) equals to \$80,391,000 and is the "Base Case" 2009 test year estimate for Other Production O&M expenses as presented in HECO T-7 direct testimony.
 - b. Column (B) represents the total Rate Case Update Adjustments of \$3,176,000 and the details are described in Attachment 1.
 - c. Column (C) is the "Rate Case Update Base Case" Other Production O&M expenses totaling \$83,567,000 and is the sum of the "Base Case" at direct (column (A)) and the "Rate Case Update Adjustments" (column (B)).
 - d. As stated above, the Other Production O&M expenses related to CIP CT-1 assuming a service date of July 31, 2009 is \$1,474,000, the sum of columns (D), (E) and (F).
 - e. Column (G) is the "Rate Case Update Interim" amount of \$82,093,000 and is representative of the rate case update with zero expenses for CIP CT-1.
 - f. The final step is to sum the "Rate Case Update Interim" amount (column (G)) and the total CIP CT-1 expense as if it had operated for the full year (columns (H), (I), and (J)). This sum shown as column (K) equals to \$84,643,000 and is the "Rate

Case Update CIP CT-1 Generating Unit Step” or the 2009 test year estimate for Other Production O&M expenses including estimated expenses for CIP CT-1 as if it had operated for a full year.

Rate Case Update -Other Production O&M expenses – Base Case, W/O HCEI Implementation Study, W/O HCEI Implementation Study and W/O CIP CT-1,
W/O HCEI Implementation Study and with Full Cost of CIP CT-1

Other Production O&M expenses are also adjusted in a series of steps, as summarized on Attachment 14, page 4, to also account for the HCEI Implementation Study expenses as described below.

- 1) Column (A) equals to \$80,391,000 and is the “Base Case” 2009 test year estimate for Other Production O&M expenses as presented in HECO T-7 direct testimony.
- 2) The sum of the Rate Case Update Adjustments is \$3,176,000 and the details are described in Attachment 1.
- 3) The “Rate Case Update Base Case” (column (C)) is the sum of the “Base Case” amount (column (A)) and the “Rate Case Update Adjustments” (column (B)) or \$83,567,000.
- 4) The total expenses for the HCEI Implementation Study is \$2,220,000 (Rate Case Update, HECO T-7, Attachment 1, Adjustments 1 to 5) as shown in column (D).
- 5) The “Rate Case Update Base Case” (column (C)) is reduced to the “Rate Case Update W/O HCEI Implementation Study” (column (E)) by reversing all expenses related to the HCEI Implementation Study in column (D). The “Rate Case Update W/O HCEI Implementation Study” of \$81,347,000 is representative of a case with zero expenses related to the HCEI Implementation Study and partial year expenses for CIP CT-1.
- 6) The “Rate Case Update W/O HCEI Implementation Study” (column (E)) is adjusted to remove \$1,474,000 of partial year expenses for CIP CT-1. The “Rate Case Update W/O HCEI W/O CT-1” total of \$79,873,000 (column (G)) is representative of a case with zero expenses related to the HCEI Implementation Study and zero expenses related to CIP CT-1.
- 7) The Full Year cost of \$2,550,000 for CIP CT-1 (column (H)) is added to obtain the “Rate Case Update W/O HCEI WITH CIP CT-1 FULL COST” or a total of \$82,423,000 (column (I)), which represents a case of zero expenses for the HCEI Implementation Study and includes the full year cost for CIP CT-1.

Hawaiian Electric Company, Inc.
2009 TEST YEAR

UPDATED HECO-702, Page 1

RATE CASE UPDATE - OTHER PRODUCTION O&M EXPENSE - BASE CASE, INTERIM INCREASE, CIP CT-1 STEP INCREASE

(\$ Thousands)

	(A)	(B)	(C= A+B)	(D)	(E)	(F)	(G=C+D+E+F)	(H)	(I)	(J)	(K=G+H+I+J)
	BASE CASE	RATE CASE	RATE CASE	REVERSE	REVERSE	RATE CASE	RATE CASE	ADD	ADD	RATE CASE	RATE CASE
	2009 TY	UPDATE	BASE CASE	EXPENSES	FOR	ADJS 12-13	INTERIM	CIP CT-1	CIP CT-1	ADJS 12-13	CIP CT-1 GEN
	ESTIMATE	ADJS	2009 TY	IN 2009	CIP CT-1	FOR	2009 TY EST	FULL COST	BUDGET ADJ	FOR	UNIT STEP
	AT DIRECT		ESTIMATE	OPER BUDGET	IN DIRECT	CIP CT-1	W/O CIP CT-1	AT DIRECT	AT DIRECT	CIP CT-1	2009 TY EST
OTHER PRODUCTION OPERATIONS EXPENSE											
1 Labor	\$ 15,402	\$ 427	\$ 15,829	\$ (316)	\$ (87)		\$ 15,426	\$ 647	\$ 87		\$ 16,160
2 Non-Labor	\$ 16,998	\$ 2,702	\$ 19,700	\$ (450)	\$ (62)	\$ 12	\$ 19,200	\$ 773	\$ 62	\$ (12)	\$ 20,023
3 TOTAL	\$ 32,400	\$ 3,129	\$ 35,529	\$ (766)	\$ (149)	\$ 12	\$ 34,626	\$ 1,420	\$ 149	\$ (12)	\$ 36,183
OTHER PRODUCTION MAINTENANCE EXPENSE											
4 Labor	\$ 17,610	\$ -	\$ 17,610	\$ (236)	\$ -	\$ -	\$ 17,374	\$ 536			\$ 17,910
5 Non-Labor	\$ 30,381	\$ 47	\$ 30,428	\$ (338)	\$ -	\$ 3	\$ 30,093	\$ 460		\$ (3)	\$ 30,550
6 TOTAL	\$ 47,991	\$ 47	\$ 48,038	\$ (574)	\$ -	\$ 3	\$ 47,467	\$ 996	\$ -	\$ (3)	\$ 48,460
OTHER PRODUCTION O&M EXPENSE - TOTAL											
7 Labor	\$ 33,012	\$ 427	\$ 33,439	\$ (552)	\$ (87)	\$ -	\$ 32,800	\$ 1,183	\$ 87	\$ -	\$ 34,070
8 Non-Labor	\$ 47,379	\$ 2,749	\$ 50,128	\$ (788)	\$ (62)	\$ 15	\$ 49,293	\$ 1,233	\$ 62	\$ (15)	\$ 50,573
9 TOTAL	\$ 80,391	\$ 3,176	\$ 83,567	\$ (1,340)	\$ (149)	\$ 15	\$ 82,093	\$ 2,416	\$ 149	\$ (15)	\$ 84,643
Sum of Columns D, E, and F =						\$ (1,474)	Sum of Columns H, I, and J				
							\$ 2,550				

Source:

Column A: HECO-701, Column D.

Column B: Rate Case Update, HECO T-7, Attachment 1, Page 1.

Columns D and H: HECO-WP-709. Amounts are net of on-costs for corp administration, payroll taxes and employee benefits that are removed from Other Production O&M expenses as G/L code adjustments.

Column E: HECO-734 and HECO-WP-709. Reverses CIP CT-1 budget adjustments for air quality monitoring stations (minus \$155k), fish monitoring (minus \$27k) and emission fees (plus \$33k).

Column F: Rate Case Update, HECO T-7, Attachment 1, add back adjustment # 13 Clean membership fees (\$12) and adjustment #12 Overhead Crane Annual Inspection (\$3k) since the reductions are included in Column B. This zeros out rate case update adjustments related to CIP CT-1.

Column I: HECO-734 and HECO-WP-709. Adds back CIP CT-1 budget adjustments for air quality monitoring stations (plus \$155k), fish monitoring (plus \$27k) and Emission fees for CIP CT-1 (minus \$33k). In direct, the adjustment was reported as \$182k and incorrectly omitted the minus \$33k emission fee adjustment.

Column J: Rate Case Update, HECO T-7, Attachment 1, add back rate case update adjustment #13 Clean membership fees (minus \$12) and adjustment # 12 Overhead Crane Annual Inspection (minus \$3k).

RATE CASE UPDATE
 DOCKET NO. 2008-0083
 HECO T-7
 ATTACHMENT 14
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 HECO-702
 DOCKET NO. 2008-0083
 PAGE 1 OF 1

Hawaiian Electric Company, Inc.

2009 TEST YEAR

Added HECO-702, Page 2

RATE CASE UPDATE - OTHER PROD O&M EXPENSE - BASE CASE, W/O HCEI, W/O HCEI & W/O CT-1, W/O HCEI WITH CT-1 FULL COST

(\$ Thousands)

	(A)	(B)	(C= A+B)	(D)	(E=C+D)	(F)	(G= E+F)	(H)	(I=G+H)
	BASE CASE	RATE CASE	RATE CASE	REVERSE	RATE CASE	REVERSE	RATE CASE	ADD	RATE CASE
	2009 TY	UPDATE	BASE CASE	HCEI	W/O HCEI	UPDATE	UPDATE	UPDATE	W/O HCEI
	ESTIMATE	ADJS	2009 TY	IMPLEM	IMPLEM	CIP CT-1	W/O HCEI	CIP CT-1	WITH CIP CT-1
	AT DIRECT		ESTIMATE	STUDY EXP	STUDY EXP	EXPENSE	W/O CIP CT-1	FULL COST	FULL COST
OTHER PRODUCTION OPERATIONS EXPENSE									
1 Labor	\$ 15,402	\$ 427	\$ 15,829	\$ -	\$ 15,829	\$ (403)	\$ 15,426	\$ 734	\$ 16,160
2 Non-Labor	\$ 16,998	\$ 2,702	\$ 19,700	\$ (2,220)	\$ 17,480	\$ (500)	\$ 16,980	\$ 823	\$ 17,803
3 TOTAL	\$ 32,400	\$ 3,129	\$ 35,529	\$ (2,220)	\$ 33,309	\$ (903)	\$ 32,406	\$ 1,557	\$ 33,963
OTHER PRODUCTION MAINTENANCE EXPENSE									
4 Labor	\$ 17,610	\$ -	\$ 17,610	\$ -	\$ 17,610	\$ (236)	\$ 17,374	\$ 536	\$ 17,910
5 Non-Labor	\$ 30,381	\$ 47	\$ 30,428	\$ -	\$ 30,428	\$ (335)	\$ 30,093	\$ 457	\$ 30,550
6 TOTAL	\$ 47,991	\$ 47	\$ 48,038	\$ -	\$ 48,038	\$ (571)	\$ 47,467	\$ 993	\$ 48,460
OTHER PRODUCTION O&M EXPENSE - TOTAL									
7 Labor	\$ 33,012	\$ 427	\$ 33,439	\$ -	\$ 33,439	\$ (639)	\$ 32,800	\$ 1,270	\$ 34,070
8 Non-Labor	\$ 47,379	\$ 2,749	\$ 50,128	\$ (2,220)	\$ 47,908	\$ (835)	\$ 47,073	\$ 1,280	\$ 48,353
9 TOTAL	\$ 80,391	\$ 3,176	\$ 83,567	\$ (2,220)	\$ 81,347	\$ (1,474)	\$ 79,873	\$ 2,550	\$ 82,423

Source:

Column A: HECO-701, Column D.

Column B : Rate Case Update, HECO T-7, Attachment 1, Page 1.

Column D: Rate Case Update, HECO T-7, Attachment 1, Adjustments 1 to 5.

Column F : Rate Case Update, HECO T-7, Attachment 14, Page 3, sum of Columns D, E and F.

Column H: Rate Case Update, HECO T-7, Attachment 14, Page 3, sum of Columns H, I, and J.

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TEST YEAR: 2009

(\$ Thous)	Test Year Estimates		Change	Rate Case Update	Change	RC Upd w/o CT-1	Change	RC Upd CT-1 Full Cost
	Direct	Present Rates						

RATE BASE

Production Stores Inventory	BEG BAL	8,562	0	8,562	0	8,562		8,562
	END BAL	9,057	0	9,057		9,057		9,057

INCOME STATEMENT ITEMS

Production					(K)		(L)	
	80,391	3,176	83,567	(1,474)	82,093	2,550	84,643	

Production O&M- Base Case Change (In-Service Date 8/1/08)

2009 Budgeted CT1 (I) (1,325) Note (1). Net of On-Cost reclass for GL Code adjustments. See separate schedule.

Emis Fees Bud Adj 33 Bud Adj for -\$33k (to report operation part of the year instead of full year) already reported in \$80,391k TY Estimate, therefore excluded.

CIP CT1 Air Quality Bud Adj (155) Not reflected in 2009 Orig Budget, but included in TY Estimate.

CIP CT1 Fish Mon Bud Adj (27) Not reflected in 2009 Orig Budget, but included in TY Estimate.

As Adjusted (1,474) (K)

Production O&M- Annualization Change (Full Year Amount)

2009 Annualized CT1 (J) 2,401 Note (2). See separate schedule.

Emis Fees Bud Adj (33) Note (3).

CIP CT1 Air Quality Bud Adj 155 Not reflected in \$2,401k above.

CIP CT1 Fish Mon Bud Adj 27 Not reflected in \$2,401k above.

As Adjusted 2,550 (L)

Note (1): \$1,325K = \$1,340K (from HECO-WP-709, page 1) - \$3K (Adjustment #12) - \$12K (Adjustment #13).

Note (2): \$2,401K = \$2,416K (from HECO-WP-709, page 1) - \$3K (Adjustment #12) - \$12K (Adjustment #13).

Note (3): In HECO-WP-709, page 1, the emission fees related to CIP CT-1 were not properly adjusted from the 2009 Annualized CT-1 Full Year Amount. Updated HECO WP-709 reports the adjustment.

Hawaiian Electric Company, Inc.

CIP CT 1 Unit - Calculation of Unit Full Cost (Revised - Rate Case Update)

UPDATED HECO-WP-709

PURPOSE: The purpose of this worksheet is to calculate the full cost for CIP CT-1 O&M using available 2009 budgeted O&M and capital cost.

SUMMARIZED FROM DETAILS BELOW:

2009 Budgeted O&M	\$1,546,727 (D) (All shaded and italicized amounts)
Less: On-Cost Corp Adm, EB, PT	(\$221,921) [(E) + (F)] Represent GL code adjustment reclassified and reported as A&G cost. See HECO T-11 for calculations.
Net of reclassified on-cost	\$1,324,806 (I)
Total Calculated Full Cost O&M:	\$2,875,094 (G) All cost
Less: On-Cost Corp Adm, EB, PT	(\$473,877) [(E) + (F) + sum(H)] Represent GL code adjustment reclassified and reported as A&G cost. See HECO T-11 for calculations.
Net of reclassified on-cost	\$2,401,217 (J)

	EE	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Operations (O&M)														
Direct Labor (Excl 421. In On-Cost)		\$6,980	\$6,863	\$8,004	\$7,922	\$7,122	\$7,809	\$7,704	\$49,837	\$48,014	\$44,527	\$36,923	\$46,867	\$278,571
On-Costs - NonProductive Wages	421	\$930	\$940	\$1,075	\$1,075	\$955	\$1,060	\$1,025	\$6,640	\$6,405	\$5,925	\$4,910	\$6,215	\$37,155
		\$7,910	\$7,803	\$9,079	\$8,997	\$8,077	\$8,869	\$8,729	\$56,477	\$54,419	\$50,452	\$41,833	\$53,082	\$315,726
Non-Labor														
On-Costs - Power Supply Clearing	405	\$1,695	\$1,916	\$2,491	\$2,491	\$1,946	\$2,160	\$2,089	\$13,532	\$13,053	\$12,075	\$10,007	\$12,666	\$75,722
On-Costs - Corp Admin	406	\$738	\$746	\$854	\$854	\$758	\$842	\$814	\$5,272	\$5,088	\$4,704	\$3,899	\$4,935	\$29,501
On-Costs - Employee Benefits	422	\$2,014	\$2,036	\$2,328	\$2,328	\$2,069	\$2,298	\$2,220	\$14,382	\$13,873	\$12,834	\$10,635	\$13,462	\$80,478
On-Costs - Payroll Taxes	423	\$579	\$569	\$663	\$667	\$590	\$647	\$639	\$4,131	\$3,980	\$3,691	\$3,061	\$3,885	\$23,093
Sub- On-Costs Corp Adm, EB, PT		\$3,331	\$3,351	\$3,945	\$3,838	\$3,417	\$3,785	\$3,673	\$23,785	\$22,940	\$21,229	\$17,595	\$22,282	\$133,072
Safety Equip: Shoes, Glasses, Oth (A)	201	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,200
Operate & Monitor Plant Equip - General (A)	201	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$3,600
LPB, Lube Oil, Diesel (A)	201	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$3,600
Electric Plant Supplies (A)	201	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$300	\$3,600
Waste Water Treat. Chem (A)	201	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$84,000
Demin/Evap. Chemicals (A)	201	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$24,000
Boiler Water Treatment (A)	201	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000	\$84,000
Permit Reg Air (Pwr Supply O&M) (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0 (X)
Permit Reg Air (Environmental) (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,693	\$9,692	\$9,692	\$9,692	\$9,692	\$48,461
Comply Ongoing Wstewtr (C)	508	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,221	\$20,221
Foss, Environ. Svcs (A)	501	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Sewage (A)	501	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$150	\$1,800
RO Water (A)	501	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$180,000
City Water (A)	501	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Telephones (A)	501	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$400	\$4,800
Cell Phones, Pgrrs, SalCom (A)	501	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Exterminator Svc/Land (A)	501	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$18,000
Janitorial (A)	501	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$24,000
Provide/manage Svcs-Waste/Refuse (A)	501	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Landscaping (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$25,000	\$0	\$0	\$25,000
Haz Waster Disposal (B)	501	\$0	\$0	\$7,000	\$0	\$0	\$7,000	\$0	\$7,000	\$0	\$0	\$0	\$7,000	\$28,000
Stores On-Cost (A)	401	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$1,790	\$20,733
Vehicles (A)	301	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$546	\$6,550
		\$45,612	\$45,653	\$53,422	\$46,415	\$45,748	\$52,584	\$46,174	\$87,370	\$93,071	\$108,382	\$77,629	\$112,248	\$814,309
TOTAL OPERATIONS		\$53,522	\$53,456	\$62,501	\$55,412	\$53,825	\$61,453	\$54,903	\$143,847	\$147,490	\$158,834	\$119,462	\$165,330	\$1,130,035

RATE CASE UPDATE
 DOCKET NO. 2008-0083
 HECO T-7
 ATTACHMENT 14
 PAGE 6 OF 11
 HECO-WP-709
 DOCKET NO. 2008-0083
 PAGE 2 OF 4

PURPOSE: The purpose of this worksheet is to calculate the full cost for CIP CT-1 O&M using available 2009 budgeted O&M and capital cost.

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Net of reclassified on-cost	\$2,401,217 (J)

	EE	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Maintenance (O&M)														
Direct Labor (Excl EE 421, In On-Costs)		\$2,166	\$2,077	(\$1,081)	(\$1,193)	\$2,210	\$5,923	\$5,967	\$43,413	\$46,193	\$45,283	\$27,000	\$34,001	\$211,980
On-Costs - Nonproductive Wages	421	\$245	\$235	(\$120)	(\$135)	\$250	\$670	\$675	\$4,935	\$5,250	\$5,145	\$3,070	\$3,860	\$24,080
		\$2,411	\$2,312	(\$1,181)	(\$1,328)	\$2,460	\$6,593	\$6,642	\$48,348	\$51,443	\$50,428	\$30,070	\$37,861	\$236,060
Non-Labor														
On-Costs - Power Supply Clearing	405	\$499	\$479	(\$245)	(\$275)	\$510	\$1,365	\$1,376	\$10,058	\$10,700	\$10,486	\$8,257	\$7,867	\$49,075
On-Costs - Corp Admin	406	\$195	\$187	(\$95)	(\$107)	\$199	\$532	\$536	\$3,918	\$4,169	\$4,085	\$2,438	\$3,065	\$19,120
On-Costs - Employee Benefits	422	\$531	\$509	(\$280)	(\$292)	\$542	\$1,451	\$1,462	\$10,689	\$11,372	\$11,144	\$6,650	\$8,361	\$52,157
On-Costs - Payroll Taxes	423	\$180	\$172	(\$88)	(\$99)	\$183	\$491	\$495	\$3,599	\$3,829	\$3,764	\$2,238	\$2,819	\$17,573
Sub- On-Costs Corp Adm, EB, PT		\$906	\$868	(\$443)	(\$498)	\$924	\$2,474	\$2,492	\$18,206	\$19,369	\$18,982	\$11,325	\$14,244	\$88,850
Maint GEN & rel eq/PRED (A)	201	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Maint Gen R rel eq/PREV (A)	201	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Maint Sta Com struct/PREV (A)	201	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Maint Pll & rel eq/PREV (A)	201	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Maint Gen & rel eq/PREV (A)	201	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Maint Sta Com Misc EQ-PREV (A)	201	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Maint Fuel FD PREV (A)	201	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Maint Pll Eq- Pred - Gen Plant - Trend (A)	501	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$6,000
Maint Sta Com str/ PREV- Gen Pl- Trend (A)	501	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,200
Elevator maint (A)	501	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,200
Air Cond maint (A)	501	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$200	\$2,400
Clean Solvent (A)	501	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,200
Maint Sta Com struct- Gen Plant- Trend (A)	501	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Air Cond Repairs HP000360 (A)	501	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$1,200
Elevator Repairs HP000750 (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$500	\$500
Maint Blr Pll Eq - Gen Plant - Trend (A)	501	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$12,000
Facility Repairs (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$80,000	\$80,000	\$0	\$160,000
Waste Water Facility Maint (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$10,000	\$10,000	\$0	\$10,000
Demin Maintenance (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$30,000	\$30,000	\$0	\$30,000
Gantry Crane Annual Inspection (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,500	\$0	\$0	\$0	\$1,500
Blackstart Maintenance (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$20,000	\$0	\$20,000
A/C Duct Cleaning and Disinfection (C)	501	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,000	\$0	\$5,000
Stores On-Cost (A)	401	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$579	\$6,949
Vehicles - Sedan (A)	301	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$798	\$9,500
		\$11,382	\$11,324	\$9,289	\$9,204	\$11,411	\$13,816	\$13,883	\$38,204	\$41,546	\$119,446	\$172,483	\$32,588	\$484,575
TOTAL MAINTENANCE		\$13,793	\$13,636	\$8,108	\$7,876	\$13,871	\$20,409	\$20,525	\$86,552	\$92,989	\$169,874	\$202,553	\$70,449	\$720,635
TOTAL OPERATIONS & MAINTENANCE		\$67,315	\$67,092	\$70,609	\$63,288	\$67,696	\$81,862	\$75,428	\$230,399	\$240,479	\$328,708	\$322,015	\$235,779	\$1,850,669

Hawaiian Electric Company, Inc.
CIP CT 1 Unit - Calculation of Unit Full Cost (Revised - Rate Case Update)
UPDATED HECO-WP-709

PURPOSE: The purpose of this worksheet is to calculate the full cost for CIP CT-1 O&M using available 2009 budgeted O&M and capital cost.

SUMMARIZED FROM DETAILS BELOW:

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Net of reclassified on-cost	\$1,324,806 (I)
Total Calculated Full Cost O&M:	\$2,875,094 (G) All cost
Less: On-Cost Corp Adm, EB, PT	(\$473,877) ((E) + (F) + sum(H)) Represent GL code adjustment reclassified and reported as A&G cost. See HECO T-11 for calculations.
Net of reclassified on-cost	\$2,401,217 (J)

	EE	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total
Capital (January - July 2009) (2)														
Operations Capital														
Direct Labor	150	\$38,698	\$38,800	\$43,788	\$42,846	\$40,398	\$45,030	\$47,525	\$0	\$0	\$0	\$0	\$0	\$292,085
On-Costs - NonProductive Wages	421	\$5,135	\$4,485	\$5,810	\$5,685	\$5,360	\$5,975	\$6,305	\$0	\$0	\$0	\$0	\$0	\$38,755
		\$43,833	\$43,285	\$49,598	\$48,531	\$45,758	\$51,005	\$53,830	\$0	\$0	\$0	\$0	\$0	\$330,840
On-Costs - Power Supply Clearing	405	\$10,465	\$9,740	\$11,841	\$11,586	\$10,924	\$12,177	\$12,850	\$0	\$0	\$0	\$0	\$0	\$78,983
On-Costs - Corp Admin	406	\$4,077	\$3,561	\$4,619	\$4,614	\$4,256	\$4,744	\$5,008	\$0	\$0	\$0	\$0	\$0	\$30,771
On-Costs - Employee Benefits	422	\$11,122	\$9,715	\$12,584	\$12,814	\$11,610	\$12,942	\$13,657	\$0	\$0	\$0	\$0	\$0	\$83,944
On-Costs - Payroll Taxes	423	\$3,208	\$2,802	\$3,630	\$3,552	\$3,949	\$3,733	\$3,940	\$0	\$0	\$0	\$0	\$0	\$24,214
		\$18,407	\$16,078	\$20,827	\$20,380	\$19,215	\$21,419	\$22,603	\$0	\$0	\$0	\$0	\$0	\$138,929 (H)
Total Operations Capital		\$72,705	\$63,503	\$82,268	\$80,497	\$75,897	\$84,601	\$89,283	\$0	\$0	\$0	\$0	\$0	\$548,752
Maintenance Capital														
Direct Labor	150	\$36,082	\$34,942	\$39,011	\$39,044	\$35,298	\$43,922	\$42,478	\$0	\$0	\$0	\$0	\$0	\$269,577
On-Costs - NonProductive Wages	421	\$4,109	\$3,905	\$4,430	\$4,440	\$4,010	\$4,925	\$4,825	\$0	\$0	\$0	\$0	\$0	\$30,635
		\$40,192	\$38,847	\$43,441	\$43,484	\$39,308	\$48,847	\$47,303	\$0	\$0	\$0	\$0	\$0	\$300,212
On-Costs - Power Supply Clearing	405	\$9,355	\$7,958	\$9,028	\$9,049	\$8,472	\$10,037	\$9,834	\$0	\$0	\$0	\$0	\$0	\$62,434
On-Costs - Corp Admin	406	\$3,255	\$3,101	\$3,517	\$3,625	\$3,184	\$3,910	\$3,832	\$0	\$0	\$0	\$0	\$0	\$24,324
On-Costs - Employee Benefits	422	\$9,881	\$8,458	\$9,595	\$9,617	\$8,688	\$10,668	\$10,450	\$0	\$0	\$0	\$0	\$0	\$66,355
On-Costs - Payroll Taxes	423	\$2,991	\$2,847	\$3,234	\$3,237	\$2,928	\$3,591	\$3,522	\$0	\$0	\$0	\$0	\$0	\$22,348
		\$15,127	\$14,406	\$16,346	\$16,378	\$14,786	\$18,169	\$17,804	\$0	\$0	\$0	\$0	\$0	\$113,027 (H)
Total Maintenance Capital		\$63,665	\$60,611	\$68,845	\$68,912	\$62,276	\$76,453	\$74,941	\$0	\$0	\$0	\$0	\$0	\$475,673
TOTAL CAPITAL		\$136,370	\$124,114	\$151,081	\$149,409	\$138,173	\$161,054	\$164,224	\$0	\$0	\$0	\$0	\$0	\$1,024,425
TOTAL O&M AND CAPITAL- (Calc Full Cost)		\$203,685	\$191,206	\$221,690	\$212,697	\$205,869	\$242,916	\$239,652	\$230,399	\$240,479	\$328,708	\$322,015	\$235,779	\$2,875,094 (G)
Total 2009 Budgeted O&M- Piller		\$16,952	\$16,729	\$13,246	\$12,825	\$17,333	\$36,735	\$15,428	\$230,399	\$240,479	\$328,708	\$322,015	\$235,779	\$1,546,727 (D)
Total 2009 Capital- Piller		\$136,370	\$124,114	\$151,081	\$149,409	\$138,173	\$161,054	\$164,224	\$0	\$0	\$0	\$0	\$0	\$1,024,425
Total O&M and Capital- Piller		\$153,322	\$140,843	\$164,327	\$162,234	\$155,506	\$197,789	\$239,652	\$230,399	\$240,479	\$328,708	\$322,015	\$235,779	\$2,571,152

Notes:

- Shaded, italicized amounts are budgeted 2009 used as the starting numbers to calculate a full year's cost.

- O&M Labor cost budgeted prior to CIP CT-1 in service date of July 31, 2009 is for administrative, supervisory and warehouse personnel time incurred throughout the year.
- There are some Non-Labor O&M costs incurred prior to CIP CT-1 July 31, 2009 in-service date due to preparation prior to unit going live.

- (A) - Represent routine type work that expect to incur charge every month, therefore show monthly cost in earlier months.
- (B) - Represent routine type work, incurring cost on a quarterly basis, therefore, show quarterly cost in earlier months.
- (C) - Represent non-routine type work, that would normally occur one time or annually, therefore, no additional cost shown in earlier months.

- (1) - Negative amount in labor and on-cost in March and April due to correction to labor that should have been booked in June and July. No material impact. Further work not necessary.
- (2) - Represent the budget, capital labor cost for the 7-Operations and 8-Maintenance staff who will be operating and maintaining CIP CT-1. All staff hired in January 2009. Most of their time productive time prior to the July 31, 2009 go-live date will be spent on "first-time training" on CIP CT-1 which is reported as capital cost. For purpose of this workpaper, use the reported capital cost as the January - July labor cost in calculating the full cost for CIP CT-1.

Comments for Rate Case Update:

- (X) - Reduced by \$12,500. Represents Fuel Expense and not Production O&M Expense. See further comments in the November Update. See comments in response to CA-IR-207.
- (Y) - Update from \$4,200 down to \$1,500. Reduced by \$2,700 as gantry crane annual inspection cost for CIP CT-1 was overstated. See comments in response to CA-IR-208.

Other Production O&M - CIP CT-1 Cost: Rate Case Update with Sales Forecast Reduction

TEST YEAR: 2009

		Test Year Estimates Direct Present Rates	Change	Rate Case Update	Change	RC Upd w/o CT-1	Change	RC Upd CT-1 Full Cost
RATE BASE								
Production Stores Inventory	BEG BAL	8,562	0	8,562	0	8,562		8,562
	END BAL	9,057	0	9,057		9,057		9,057
INCOME STATEMENT ITEMS								
Production		80,391	3,133	83,524	(K) (1,470)	82,054	(L) 2,546	84,600

Production O&M- Base Case Change (In-Service Date 8/1/08)		
2009 Budgeted CT1	(I)	(1,325) Note (1). Net of On-Cost reclass for GL Code adjustments. See separate schedule.
Emis Fees Bud Adj	33	Bud Adj for -\$33k (to report operation part of the year instead of full year) already reported in \$80,391k TY Estimate, therefore excluded.
Emis Fees Bud Adj	4	Adjustment under sales forecast reduction scenario. See comments in HECO T-7, Rate Case Update.
CIP CT1 Air Quality Bud Adj	(155)	Not reflected in 2009 Orig Budget, but included in TY Estimate.
CIP CT1 Fish Mon Bud Adj	(27)	Not reflected in 2009 Orig Budget, but included in TY Estimate.
As Adjusted		<u>(1,470)</u> (K)
Production O&M- Annualization Change (Full Year Amount)		
2009 Annualized CT1	(J)	2,401 Note (2). See separate schedule.
Emis Fees Bud Adj	(33)	Note (3).
Emis Fees Bud Adj	(4)	Adjustment under sales forecast reduction scenario. See comments in HECO T-7, Rate Case Update.
CIP CT1 Air Quality Bud Adj	155	Not reflected in \$2,401k above.
CIP CT1 Fish Mon Bud Adj	27	Not reflected in \$2,401k above.
As Adjusted		<u>2,546</u> (L)

Note (1): \$1,325K = \$1,340K (from HECO-WP-709, page 1) - \$3K (Adjustment #12) - \$12K (Adjustment #12).

Note (2): \$2,401K = \$2,416K (from HECO-WP-709, page 1) - \$3K (Adjustment #12) - \$12K (Adjustment #13).

Note (3): In HECO-WP-709, page 1, the emission fees related to CIP CT-1 were not properly adjusted from the 2009 Annualized CT-1 Full Year Amount. Updated HECO WP-709 reports the adjustment.

Hawaiian Electric Company, Inc.
2009 TEST YEAR

**RATE CASE UPDATE - OTHER PRODUCTION O&M EXPENSE - BASE CASE, INTERIM INCREASE, CIP CT-1 STEP INCREASE
WITH SALES FORECAST REDUCTION**
(\$ Thousands)

	(A)	(B)	(C= A+B)	(D)	(E)	(F)	(G=C+D+E+F)	(H)	(I)	(J)	(K=G+H+I+J)
	BASE CASE		RATE CASE	REVERSE	REVERSE	RATE CASE	RATE CASE	ADD	ADD	RATE CASE	RATE CASE
	2009 TY	RATE CASE	UPDATE	EXPENSES	FOR	ADJS 9, 13-14	INTERIM	CIP CT-1	CIP CT-1	ADJS 9, 13-14	CIP CT-1 GEN
	ESTIMATE	UPDATE	2009 TY	IN 2009	CIP CT-1	FOR	2009 TY EST	FULL COST	BUDGET ADJ	FOR	UNIT STEP
	<u>AT DIRECT</u>	<u>ADJS</u>	<u>ESTIMATE</u>	<u>OPER BUDGET</u>	<u>IN DIRECT</u>	<u>CIP CT-1</u>	<u>W/O CIP CT-1</u>	<u>AT DIRECT</u>	<u>AT DIRECT</u>	<u>CIP CT-1</u>	<u>2009 TY EST</u>
OTHER PRODUCTION OPERATIONS EXPENSE											
1 Labor	\$ 15,402	\$ 427	\$ 15,829	\$ (316)	\$ (87)	\$	\$ 15,426	\$ 647	\$ 87	\$	\$ 16,160
2 Non-Labor	\$ 16,998	\$ 2,659	\$ 19,657	\$ (450)	\$ (62)	\$ 16	\$ 19,161	\$ 773	\$ 62	\$ (16)	\$ 19,980
3 TOTAL	\$ 32,400	\$ 3,086	\$ 35,486	\$ (766)	\$ (149)	\$ 16	\$ 34,587	\$ 1,420	\$ 149	\$ (16)	\$ 36,140
OTHER PRODUCTION MAINTENANCE EXPENSE											
4 Labor	\$ 17,610	\$ -	\$ 17,610	\$ (236)	\$ -	\$ -	\$ 17,374	\$ 536			\$ 17,910
5 Non-Labor	\$ 30,381	\$ 47	\$ 30,428	\$ (338)	\$ -	\$ 3	\$ 30,093	\$ 460		\$ (3)	\$ 30,550
6 TOTAL	\$ 47,991	\$ 47	\$ 48,038	\$ (574)	\$ -	\$ 3	\$ 47,467	\$ 996	\$ -	\$ (3)	\$ 48,460
OTHER PRODUCTION O&M EXPENSE - TOTAL											
7 Labor	\$ 33,012	\$ 427	\$ 33,439	\$ (552)	\$ (87)	\$ -	\$ 32,800	\$ 1,183	\$ 87	\$ -	\$ 34,070
8 Non-Labor	\$ 47,379	\$ 2,706	\$ 50,085	\$ (788)	\$ (62)	\$ 19	\$ 49,254	\$ 1,233	\$ 62	\$ (19)	\$ 50,530
9 TOTAL	\$ 80,391	\$ 3,133	\$ 83,524	\$ (1,340)	\$ (149)	\$ 19	\$ 82,054	\$ 2,416	\$ 149	\$ (19)	\$ 84,600
Sum of Columns D, E, and F =						\$ (1,470)	Sum of Columns H, I, and J		\$	2,546	

Source:

Column A: HECO-701, Column D.

Column B: Total adjustments from Rate Case Update, HECO T-7, Attachment 1, Page 1 minus an additional \$43,000 in Other Production Operations Expense for the decrease in emission fees due to the sales forecast reduction.

Columns D and H: HECO-WP-709. Amounts are net of on-costs for corp administration, payroll taxes and employee benefits that are removed from Other Production O&M expenses as G/L code adjustments.

Column E: HECO-734 and HECO-WP-709. Reverses CIP CT-1 budget adjustments for air quality monitoring stations (minus \$155k), fish monitoring (minus \$27k) and emission fees (plus \$33k).

Column F: Add back portion of the emission fees reduction related to CIP CT-1 (\$4k), Clean membership fees (\$12) and Overhead Crane Annual Inspection (\$3k) since the reductions are included in Column B. This zeros out rate case update adjustments related to CIP CT-1.

Column I: HECO-734 and HECO-WP-709. Adds back CIP CT-1 budget adjustments for air quality monitoring stations (plus \$155k), fish monitoring (plus \$27k) and Emission fees for CIP CT-1 (minus \$33k). In direct, the adjustment was reported as \$182k and incorrectly omitted the minus \$33k emission fee adjustment.

Column J: Rate Case Update, HECO T-7, Attachment 1, add back Clean membership fees (minus \$12), Overhead Crane Annual Inspection (minus \$3k) and emission fee related to CIP CT-1 (\$4k).

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Hawaiian Electric Company, Inc.

2009 TEST YEAR

**RATE CASE UPDATE - OTHER PRODUCTION O&M EXPENSE - BASE CASE, W/O HCEI, W/O HCEI & CT-1, W/O HCEI WITH CT-1 FULL COST
WITH SALES FORECAST REDUCTION**

(\$ Thousands)

	(A)	(B)	(C= A+B)	(D)	(E=C+D)	(F)	(G= E+F)	(H)	(I=G+H)
	BASE CASE	RATE CASE	RATE CASE	REVERSE	RATE CASE	REVERSE	RATE CASE	ADD	RATE CASE
	2009 TY	UPDATE	UPDATE	HCEI	W/O HCEI	UPDATE	UPDATE	UPDATE	W/O HCEI
	ESTIMATE	ADJS	2009 TY	IMPLEM	IMPLEM	CIP CT-1	W/O HCEI	CIP CT-1	WITH CIP CT-1
	AT DIRECT		ESTIMATE	STUDY EXP	STUDY EXP	EXPENSE	W/O CT-1	FULL COST	FULL COST
OTHER PRODUCTION OPERATIONS EXPENSE									
1 Labor	\$ 15,402	\$ 427	\$ 15,829	\$ -	\$ 15,829	\$ (403)	\$ 15,426	\$ 734	\$ 16,160
2 Non-Labor	\$ 16,998	\$ 2,659	\$ 19,657	\$ (2,220)	\$ 17,437	\$ (496)	\$ 16,941	\$ 819	\$ 17,760
3 TOTAL	\$ 32,400	\$ 3,086	\$ 35,486	\$ (2,220)	\$ 33,266	\$ (899)	\$ 32,367	\$ 1,553	\$ 33,920
OTHER PRODUCTION MAINTENANCE EXPENSE									
4 Labor	\$ 17,610	\$ -	\$ 17,610	\$ -	\$ 17,610	\$ (236)	\$ 17,374	\$ 536	\$ 17,910
5 Non-Labor	\$ 30,381	\$ 47	\$ 30,428	\$ -	\$ 30,428	\$ (335)	\$ 30,093	\$ 457	\$ 30,550
6 TOTAL	\$ 47,991	\$ 47	\$ 48,038	\$ -	\$ 48,038	\$ (571)	\$ 47,467	\$ 993	\$ 48,460
OTHER PRODUCTION O&M EXPENSE - TOTAL									
7 Labor	\$ 33,012	\$ 427	\$ 33,439	\$ -	\$ 33,439	\$ (639)	\$ 32,800	\$ 1,270	\$ 34,070
8 Non-Labor	\$ 47,379	\$ 2,706	\$ 50,085	\$ (2,220)	\$ 47,865	\$ (831)	\$ 47,034	\$ 1,276	\$ 48,310
9 TOTAL	\$ 80,391	\$ 3,133	\$ 83,524	\$ (2,220)	\$ 81,304	\$ (1,470)	\$ 79,834	\$ 2,546	\$ 82,380

Source:

Column A: HECO-701, Column D.

Column B : Rate Case Update, HECO T-7, Attachment 14, Page 10, Column (B).

Column D: Rate Case Update, HECO T-7, Attachment 1, Adjustments 1 to 5.

Column F : Rate Case Update, HECO T-7, Attachment 14, Page 10, Sum of Columns D, E and F.

Column H: Rate Case Update, HECO T-7, Attachment 14, Page 10, Sum of Columns H, I, and J.

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HECO 2009 Emission Fee Forecast

	Total W 5% contingency	Total	Covered	Non-Covered	Comments
Kahe	\$578,795	\$551,234	\$443,234	\$108,000	
Waiau	\$277,199	\$263,999	\$212,275	\$51,724	
Honolulu	\$44,547	\$42,426	\$34,114	\$8,312	
CIP	\$12,167	\$11,588	\$9,317	\$2,270	
DGs	\$2,500	\$2,500		\$2,500	Assumes no new DG. No contingency. Based on \$500 per site (fixed NCSP FEE), 5 sites.
TOTALS	\$915,208	\$871,746	\$698,940	\$172,806	

Based on Prodsim results emailed by Generation Planning on 10/17/08

FORM F-1
2009 ANNUAL FEE FORECAST FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)
 INPUT DATA IN YELLOW COLORED CELLS

Permit No.: 0240-01-C
 Date Rec'd:

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO - Kahe Power Plant	B. Location: 92-200 Farrington Highway	C. Island: Oahu
D. Mailing Address: P.O. Box 2750	E. City: Honolulu F. State: HI	G. Zip Code: 96840
H. Contact Person: Michael DeCaprio	I. Title: Senior Environmental Scientist	J. Telephone No.: 808-543-4535
K. Responsible Official: Thomas C. Simmons	L. Title: VP, Power Supply	M. Telephone No.: (808) 543-4301
N. Signature: _____ Date: _____		

Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete

2. CALCULATED EMISSIONS (Report emissions to the nearest tenth of a ton (Line 2.B.) and total annual emis. (Line 2.C.) subject to fees without the fraction(s) of a ton)

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)												Annual Total
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)												
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃			
K1	119.5	91.1	72.4	910.3	70.3	660.1	10.7	0.0	2.6	—			
K2	119.4	91.0	72.3	910.1	70.2	659.5	10.7	0.0	2.6	—			
K3	119.5	91.1	68.6	910.3	70.3	449.8	10.7	0.0	2.6	—			
K4	119.4	91.0	72.3	910.1	70.2	448.8	10.7	0.0	2.6	—			
A. Supplement (if appl.) A	427.2	319.1	251.6	3664.0	284.2	2169.1	43.2	0.0	10.4	—			
B. Total Report Emissions	905.0	683.3	537.2	7304.8	565.2	4387.3	86.0	0.0	20.8	—			
C. Total Emissions Subject to Fees	905			4,000		4,000	86						D. 8,991

3 ANNUAL FEE CALCULATION (Use the total annual emissions subject to fees calculated in Block 2.D.)

Total Annual Emissions Subject to Fees			Multiply	2009	Multiply	CPI Index Adjustmnt	Equal	Total
(enter 2.D. value below)				\$/TON				
Fee payable to:	"Clean Air Special Fund - COV"	A. 8,991	x	46.95	x	1.05	=	B. \$443,233.82
	"Clean Air Special Fund - NON"	C. 8,991	x	11.44	x	1.05	=	D. \$107,999.89
Total							=	E. \$551,233.71

Note: 2009 \$/ton charge payable to Clean Air Special Fund - COV = \$46.03 x 1.02 = \$46.95/ton.
 2009 \$/ton charge payable to Clean Air Special Fund - NON = \$11.22 x 1.02 = \$11.44/ton.
 If the summed amount found in 3.E is less than \$500, then pay the minimum amount of \$500, with a check made payable to the 'Clean Air Special Fund - COV.'
 If the summed amount found in 3.E is greater than \$500, then pay the fee amounts found in 3.B & 3.D with two separate checks made payable to the 'Clean Air Special Fund - COV' & 'Clean Air Special Fund - NON,' respectively.
 This spreadsheet is from 2007 emission fees. The spreadsheet was updated with forecast data for year 2009. Fee rates and CPI Index Adj. are based on known fee increases for the year 2009.

RATE CASE UPDATE
 DOCKET NO. 2008-0083
 HECO T-7
 ATTACHMENT 15
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**FORM F-2
SUPPLEMENT A**

**2009 ANNUAL FEE SUMMARY FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)
INPUT DATA IN YELLOW COLORED CELLS**

Permit No.:	0240-01-C
Date Rec'd:	

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO - Kahe Power Plant	B. Location: 92-200 Farrington Highway	C. Island: Oahu
D. Responsible Official: Thomas C. Simmons	E. Title: VP, Power Supply	F. Telephone No.: 808-543-4535
G. Signature:		Date:
Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete		

2. CALCULATED EMISSIONS (Report emissions to the nearest tenth of a ton)

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)												
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)												
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃			
K5	240.4	183.2	145.5	1832.0	141.3	1327.6	21.5	0.0	5.2	—			
K6	186.7	135.8	106.0	1832.0	141.3	835.7	21.5	0.0	5.2	—			
A	0.1	0.1	0.1	0.0	1.0	3.6	0.1	0.0	0.0	—			
B	0.0	0.0	0.0	0.0	0.6	2.2	0.1	0.0	0.0	—			
Supplement													
Total Report Emissions	427.2	319.1	251.6	3664.0	284.2	2169.1	43.2	0.0	10.4	—			

RATE CASE UPDATE
DOCKET NO. 2008-0083
HECO T-7
ATTACHMENT 15
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Inputs

No. 6 Fuel Oil			Source
Average Fuel Sulfur Content	0.400%		Kahe 2007 Average. based on heat content used in prodsim. Kahe 2007 Average.
Average Heat Content	147,619	Btu/gal	
Density	7.98	lb/gal	
No. 2 Fuel Oil			Kahe 2007 Average. based on heat content used in prodsim. Kahe 2007 Average.
Average Fuel Sulfur Content	0.0004%		
Average Heat Content	139,524	Btu/gal	
Density	6.93	lb/gal	
Propane			Kahe 2007 Average. AP-42, Section 1.5.3.1, dated 10/96. AP-42, Page A-7, Dated 9/85.
Average Fuel Sulfur Content	0.004%		
Average Heat Content	91,500	Btu/gal	
Density	4.24	lb/gal	
Used Spec Oil			Kahe 2007 Average.
Average Fuel Sulfur Content	0.080%		

Unit	Annual Fuel Usage			
	No. 6 Fuel Oil (gal/yr)	No. 2 Fuel Oil (gal/yr)	Spec Used Oil (gal/yr)	Propane (gal/yr)
Kahe 1	28,541,185	Not Applicable	31,181	1,696
Kahe 2	28,541,185	Not Applicable	1,645	1,819
Kahe 3	28,541,185	14,504	37,599	Not Applicable
Kahe 4	28,541,185	11,304	0	Not Applicable
Kahe 5	57,455,142	20,282	Not Applicable	Not Applicable
Kahe 6	57,455,142	23,266	Not Applicable	Not Applicable
Kahe A	Not Applicable	16,315	Not Applicable	Not Applicable
Kahe B	Not Applicable	9,688	Not Applicable	Not Applicable

Fuel use estimates provided by Generation Planning. Sulfur based on prior year avgs. Stack test data based on prior years data.
 Fuel data provided as aggregate for plant. 50% divided over K5-6, 50% divided over K1-4. Makes no difference on emission estimate.
 Note - Not Applicable means that the spreadsheet is not set-up to calculate emissions from that fuel for that unit.

RATE CASE UPDATE
 DOCKET NO. 2008-0083
 HECO T-7
 ATTACHMENT 15
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FORM F-1
2009 ANNUAL FEE FORECAST FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)
INPUT DATA IN YELLOW COLORED CELLS

Permit No.: 0239-01-C
Date Rec'd:

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO - Waiau Power Plant	B. Location: 475 Kamehameha Hwy.	C. Island: Oahu
D. Mailing Address: P.O. Box 2750	E. City: Honolulu F. State: HI	G. Zip Code: 96840
H. Contact Person: Michael DeCaprio	I. Title: Senior Environmental Scientist	J. Telephone No.: (808) 543-4535
K. Responsible Official: Thomas C. Simmons	L. Title: VP, Power Supply	M. Telephone No. (808) 543-4301
N. Signature:		Date:

Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete

2. CALCULATED EMISSIONS [Report emissions to the nearest tenth of a ton (Line 2.B.) and total annual emis. (Line 2.C.) subject to fees without the fraction(s) of a ton]

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)											Annual Total
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)											
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃		
3	28.6	21.8	17.4	205.9	17.4	163.2	2.6	0.0	0.6	--		
4	28.6	21.8	17.4	205.9	17.4	163.2	2.6	0.0	0.6	--		
5	36.7	28.0	22.3	264.3	22.3	209.4	3.4	0.0	0.8	--		
6	36.7	28.0	22.3	264.3	22.3	209.4	3.4	0.0	0.8	--		
A. Supplement (if appl.) A	196.8	150.4	120.0	1417.4	119.4	846.8	18.2	0.0	4.6	--		
B. Total Report Emissions	327.4	250.0	199.4	2357.8	198.8	1592.0	30.2	0.0	7.4	--		
C. Total Emissions Subject to Fees	327			2,357		1,592	30					D. 4,306

3 ANNUAL FEE CALCULATION (Use the total annual emissions subject to fees calculated in Block 2.D.)

		<u>Total Annual Emissions Subject to Fees</u>		<u>Multiply</u>	<u>2009</u>	<u>Multiply</u>	<u>CPI Index Adjustmnt</u>	<u>Equal</u>	<u>Total</u>
		(enter 2.D. value below)			<u>\$/TON</u>				
Fee payable to:	"Clean Air Special Fund - COV"	A.	4,306	x	46.95	x	1.05	=	B. \$212,275.04
	"Clean Air Special Fund - NON"	C.	4,306	x	11.44	x	1.05	=	D. \$51,723.67
								Total	E. \$263,998.71

Note: 2009 \$/ton charge payable to Clean Air Special Fund - COV = \$46.03 x 1.02 = \$46.95/ton.

2009 \$/ton charge payable to Clean Air Special Fund - NON = \$11.22 x 1.02 = \$11.44/ton.

If the summed amount found in 3.E is less than \$500, then pay the minimum amount of \$500, with a check made payable to the 'Clean Air Special Fund - COV.'

If the summed amount found in 3.E is greater than \$500, then pay the fee amounts found in 3.B & 3.D with two separate checks made payable to the 'Clean Air Special Fund - COV' & 'Clean Air Special Fund - NON,' respectively.

This spreadsheet is from 2007 emission fees. The spreadsheet was updated with forecast data for year 2009. Fee rates and CPI Index Adj. are based on known fee increases for the year 2009.

RATE CASE UPDATE
DOCKET NO. 2008-0083
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**FORM F-2
SUPPLEMENT A**

**2009 ANNUAL FEE SUMMARY FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)**
INPUT DATA IN YELLOW COLORED CELLS

Permit No.:	0239-01-C
Date Rec'd:	

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO - Waiau Power Plant	B. Location: 475 Kamehameha Hwy.	C. Island: Oahu
D. Responsible Official: Thomas C. Simmons	E. Title: VP, Power Supply	F. Telephone No.: (808) 543-4535
G. Signature: _____ Date: _____		
Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete		

2. CALCULATED EMISSIONS (Report emissions to the nearest tenth of a ton)

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)												
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)												
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃			
7	97.8	74.6	59.5	705.3	59.5	380.4	9.1	0.0	2.2	—			
8	97.8	74.6	59.5	705.3	59.5	380.4	9.1	0.0	2.2	—			
9	0.6	0.6	0.5	3.4	0.2	43.0	0.0	0.0	0.1	—			
10	0.6	0.6	0.5	3.4	0.2	43.0	0.0	0.0	0.1	—			
Supplement _____													
Total Report Emissions	196.8	150.4	120.0	1417.4	119.4	846.8	18.2	0.0	4.6	—			

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No. 6 Fuel Oil			Source
Average Fuel Sulfur Content	0.37%		2007 Waiau Average.
Average Heat Content	147,619	Btu/gal	based on heat content used in prodsim.
Density	7.88	lb/gal	2007 Waiau Average.
No. 2 Fuel Oil (Boilers)			
Average Fuel Sulfur Content	0.0006%		2007 Waiau Average.
Average Heat Content	139,524	Btu/gal	based on heat content used in prodsim.
Density	6.92	lb/gal	2007 Waiau Average.
No. 2 Fuel Oil (CTs)			
Average Fuel Sulfur Content	0.069%		2007 Waiau Average.
Average Heat Content	136,745	Btu/gal	2007 Waiau Average.
Density	6.90	lb/gal	2007 Waiau Average.
Propane			
Average Fuel Sulfur Content	0.004%		2007 Waiau Average.
Average Heat Content	91,500	Btu/gal	AP-42, Section 1.5.3.1, dated 10/96.
Density	4.24	lb/gal	AP-42, Page A-7, Dated 9/85.
Used Spec Oil			
Average Fuel Sulfur Content	0.070%		2007 Waiau Average.

Unit	Annual Fuel Usage			
	No. 6 Fuel Oil (gal/yr)	No. 2 Fuel Oil (gal/yr)	Spec Used Oil (gal/yr)	Propane (gal/yr)
Waiau 3	7,063,810	Not Applicable	202	2,755
Waiau 4	7,063,810	Not Applicable	91	2,531
Waiau 5	9,063,809	Not Applicable	129	3,820
Waiau 6	9,063,809	Not Applicable	109	3,369
Waiau 7	24,191,428	7,469	0	Not Applicable
Waiau 8	24,191,429	8,628	294	Not Applicable
Waiau 9	Not Applicable	715,246	Not Applicable	Not Applicable
Waiau 10	Not Applicable	715,246	Not Applicable	Not Applicable

Fuel use estimates provided by Generation Planning. Sulfur based on prior year avgs.

Fuel data provided as sum for all units. Est. 60% use for W7/8. Rest est. based on desired use.

CT fuel data provided as total and split evenly over units 9&10. No effect on fees.

Note - Not Applicable means that the spreadsheet is not set-up to calculate emissions from that fuel for that unit.

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FORM F-1
2009 ANNUAL FEE FORECAST FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)
 INPUT DATA IN YELLOW COLORED CELLS

Permit No.: 0238-01-C
 Date Rec'd:

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO - Honolulu Generating Station	B. Location: 170 Ala Moana Blvd.	C. Island: Oahu
D. Mailing Address: P.O. Box 2750	E. City: Honolulu F. State: HI	G. Zip Code: 96840
H. Contact Person: Michael DeCaprio	I. Title: Senior Environmental Scientist	J. Telephone No.: (808) 543-4535
K. Responsible Official: Thomas C. Simmons	L. Title: VP, Power Supply	M. Telephone No. (808) 543-4301
N. Signature:		Date:

Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete

2. CALCULATED EMISSIONS (Report emissions to the nearest tenth of a ton (Line 2.B.) and total annual emis. (Line 2.C.) subject to fees without the fraction(s) of a ton)

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)												Annual Total
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)												
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃			
8	24.9	19.0	15.2	176.3	15.3	143.9	2.3	0.0	0.6	--			
9	24.9	19.0	15.2	176.3	15.3	143.9	2.3	0.0	0.6	--			
A. Supplement (if appl.)													
B. Total Report Emissions	49.8	38	30.4	352.6	30.6	287.8	4.6	0.0	1.2	--			
C. Total Emissions Subject to Fees	49			352		287	4						D. 692

3 ANNUAL FEE CALCULATION (Use the total annual emissions subject to fees calculated in Block 2.D.)

<u>Total Annual Emissions Subject to Fees</u>				<u>Multiply</u>	<u>2009</u>	<u>Multiply</u>	<u>CPI Index Adjustmnt</u>	<u>Equal</u>	<u>Total</u>
(enter 2.D. value below)					<u>\$/TON</u>				
Fee payable to:	"Clean Air Special Fund - COV"	A.	692	x	46.95	x	1.05	= B.	\$34,113.87
	"Clean Air Special Fund - NON"	C.	692	x	11.44	x	1.05	= D.	\$8,312.30
Total								= E.	\$42,426.17

Note: 2009 \$/ton charge payable to Clean Air Special Fund - COV = \$46.03 x 1.02 = \$46.95/ton.

2009 \$/ton charge payable to Clean Air Special Fund - NON = \$11.22 x 1.02 = \$11.44/ton.

If the summed amount found in 3.E is less than \$500, then pay the minimum amount of \$500, with a check made payable to the 'Clean Air Special Fund - COV.'

If the summed amount found in 3.E is greater than \$500, then pay the fee amounts found in 3.B & 3.D with two separate checks made payable to the 'Clean Air Special Fund - COV' & 'Clean Air Special Fund - NON,' respectively.

This spreadsheet is from 2007 emission fees. The spreadsheet was updated with forecast data for year 2009. Fee rates and CPI Index Adj. are based on known fee increases for the year 2009.

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Inputs

No. 6 Fuel Oil			Source
Average Fuel Sulfur Content	0.360%		2007 Honolulu Average. based on heat content used in prodsim. 2007 Honolulu Average.
Average Heat Content	147,619	Btu/gal	
Density	7.88	lb/gal	
No. 2 Fuel Oil			
Average Fuel Sulfur Content	0.050%		2007 Honolulu Average. based on heat content used in prodsim. AP-42, Page A-6, Dated 9/85.
Average Heat Content	139,524	Btu/gal	
Density	6.93	lb/gal	
Propane			
Average Fuel Sulfur Content	0.004%		2007 Honolulu Average. AP-42, Section 1.5.3.1, dated 10/96. AP-42, Page A-7, Dated 9/85.
Average Heat Content	91,500	Btu/gal	
Density	4.24	lb/gal	
Spec Used Oil			
Average Fuel Sulfur Content	0.100%		2007 Honolulu Average.

Unit	Annual Fuel Usage			
	No. 6 Fuel Oil (gal/yr)	No. 2 Fuel Oil (gal/yr)	Spec Used Oil (gal/yr)	Propane (gal/yr)
H8	6,221,769	11,160	706	1,831
H9	6,221,770	10,218	734	4,398

Fuel use estimates provided by Generation Planning. Sulfur based on prior year avgs.
 Fuel data provided as total for station. Divided equally over all units.

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FORM F-1
2009 ANNUAL FEE FORECAST FOR COVERED SOURCES
(FOR AIR POLLUTANTS EMITTED DURING CALENDAR YEAR 2009)
 INPUT DATA IN YELLOW COLORED CELLS

Permit No.: _____
 Date Rec'd: _____

1. FACILITY INFORMATION (Signature box to be signed by Responsible Official)

A. Facility Name: HECO: CIP	B. Location:	C. Island: Oahu
D. Mailing Address: P.O. Box 2750	E. City: Honolulu	F. State: HI
G. Zip Code: 96840		
H. Contact Person: Michael DeCaprio	I. Title: Senior Environmental Scientist	J. Telephone No.: (808) 543-4535
K. Responsible Official: Thomas C. Simmons	L. Title: VP, Power Supply	M. Telephone No. (808) 543-4301
N. Signature: _____		Date: _____

Based on the information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete

2. CALCULATED EMISSIONS [Report emissions to the nearest tenth of a ton (Line 2.B.) and total annual emls. (Line 2.C.) subject to fees without the fraction(s) of a ton]

Equipment: Unit No. or Activity No.	Air Pollutant Emissions (tons/yr)												Annual Total
	Other Regulated Air Pollutants Including Hazardous Air Pollutants (please specify)												
	TSP	PM ₁₀	PM _{2.5}	SO ₂	CO	NOx	VOC	Pb	HAPs	NH ₃			
1	3.9	3.8	3.8	9.1	4.8	176.5	1.5	0.0	0.3	—			
A. Supplement (if appl.)													
B. Total Report Emissions	3.9	3.8	3.8	9.1	4.8	176.5	1.5	0.0	0.3022	—			
C. Total Emissions Subject to Fees	3			9		176	1						D. 189

3 ANNUAL FEE CALCULATION (Use the total annual emissions subject to fees calculated in Block 2.D.)

		<u>Total Annual Emissions Subject to Fees</u>	<u>Multiply</u>	<u>2009</u>	<u>Multiply</u>	<u>CPI Index Adjustmnt</u>	<u>Equal</u>	<u>Total</u>
		(enter 2.D. value below)		<u>\$/TON</u>				
Fee payable to:	"Clean Air Special Fund - COV"	A. 189	x	46.95	x	1.05	= B.	\$9,317.23
	"Clean Air Special Fund - NON"	C. 189	x	11.44	x	1.05	= D.	\$2,270.27
Total							= E.	\$11,587.50

Note: 2009 \$/ton charge payable to Clean Air Special Fund - COV = \$42.80 x 1.036 = \$44.34/ton.

2009 \$/ton charge payable to Clean Air Special Fund - NON = \$10.43 x 1.036 = \$10.81/ton.

If the summed amount found in 3.E is less than \$500, then pay the minimum amount of \$500, with a check made payable to the 'Clean Air Special Fund - COV.'

If the summed amount found in 3.E is greater than \$500, then pay the fee amounts found in 3.B & 3.D with two separate checks made payable to the 'Clean Air Special Fund - COV' & 'Clean Air Special Fund - NON,' respectively.

This spreadsheet is from 2007 emission fees. The spreadsheet was updated with forecast data for year 2009. Fee rates and CPI Index Adj. are based on known fee increases for the year 2009.

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Inputs

BIO DIESEL			Source
Average Fuel Sulfur Content	0.050%		permit limit.
Average Heat Content	119,000	Btu/gal	based on heat content used in prodsim.
Density	6.94	lb/gal	Based on: www.biodiesel.org/pdf_files/fuelfactsheets/BTU_Content_Final_Oct2005.pdf .
No. 2 Fuel Oil			
Average Fuel Sulfur Content	0.050%		permit limit.
Average Heat Content	139,524	Btu/gal	based on heat content used in prodsim.
Density	7.00	lb/gal	AP-42 .

Annual Fuel Usage				
Unit	Biodiesel (gal/yr)	No. 2 Fuel Oil (gal/yr)	Spec Used Oil (gal/yr)	Propane (gal/yr)
CIP 1	215,384	2,413,534		

Fuel use estimates provided by Generation Planning.

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RATE CASE UPDATE

Ref: Faye Chiogioji, HECO T-15, Updated Test Year Average and Test Year End of Year Employee Counts

Introduction

As discussed below and in the updates of other witnesses, HECO is making progress in staffing vacant positions and has hired a number of employees since October 31, 2008. For example, since October 31, 2008, HECO has filled 38 vacant positions, 13 of which were filled by individuals outside of HECO. An additional six external hires have completed the post offer process, with start dates occurring over the next few weeks, and 17 more external hires are currently going through the post offer process. Economic conditions are also favorable for HECO filling vacant positions (e.g., layoffs by employers).

Even with the progress HECO has and continues to make in staffing the vacant positions, and the economic conditions that are favorable to HECO for staffing the vacant positions, it will be a challenge to staff all of these positions. As a result, in order to more accurately reflect the expected 2009 test year employee count and related expenses, HECO (1) updated the employee count for the 2009 test year, and (2) proposes a \$1,729,000 test year expense reduction.

With respect to the updated 2009 test year employee count, HECO made adjustments to its employee count number. For example, in some instances HECO removed employees from the test year employee count, moved back the "hire" date of some employees (e.g., instead of showing an employee hired in January 2009 the employee is shown as being hired later in 2009), or added employees in order to reflect increased work load (e.g., increased work load due to

agreements in the HCEI Agreement¹). As a result, HECO's beginning-of-year January 2009 staffing level has increased from 1,620 to 1,625, while the end-of-year staffing level has increased from 1,621 to 1,641, resulting in an increase in the test year average from 1,621 to 1,636.

The proposed \$1,729,000 test year expense reduction is based on a regression analysis that attempts to predict actual employee count with adjustments for payroll taxes and employee benefits. (As discussed further below, this has the effect of decreasing the test year average employee count by 27 employees.)

An updated HECO-WP-1501 and HECO-1503 are presented on pages 16 and 17 of this update, respectively. The changes reflected on page 16 are noted as "Upd" for updated or "New" and are discussed in the order they appear. When applicable, copies of new position descriptions, job vacancy notices ("JVN"s) or change in personnel status ("CPS") forms are attached as supporting documents in this or other witnesses' updates. A summary of these attachments, which includes the status of the additional positions, is provided as Attachment 1.

CHANGES TO STAFFING COUNTS

1. Industrial Relations: The updated staffing count has increased from nine to ten to reflect an additional Industrial Relations Consultant who was hired on September 8, 2008. This position is required for the timely resolution of contractual (bargaining unit) issues. In 2008, new leadership was elected by members of the International Brotherhood of Electrical Workers ("IBEW") Local 1260, which represents HECO's bargaining unit employees. At

¹ The HCEI Agreement was developed and executed in October 2008 between the Governor's Office, the State Department of Business, Economic Development and Tourism and the Division of Consumer Advocacy, Department of Commerce and Consumer Affairs, and the Hawaiian Electric companies. The Agreement lays out a plan for the State to have 70% of its energy use come from clean energy sources by 2030.

the same time, a large proportion of the HECO unit officers were also newly elected. This has resulted in the need to address issues that were not issues in the past and increased work generated because of a lack of experience with the new leadership. For instance, the union leadership now insists that all communications with and from the Industrial Relations Department be in writing. Consequently, correspondence from the union leadership, mostly contentious in nature and questioning long established practices and interpretations, has caused an increase to correspondence by at least 60 percent. This position is also required to address the backlog of issues involving interpretation of the Companies' employee policies and practices and to respond to requests from the neighbor island subsidiaries (MECO and HELCO) for additional support and instruction for supervisory personnel. Industrial Relations was fortunate to find an experienced labor relations specialist with intimate knowledge of the IBEW, the bargaining unit structure, and contractual issues. Consequently, the position was filled in 2008, and the department is already at its updated test year count of ten. A CPS form, reflecting the new hire, is provided as Attachment 2. The corresponding labor expense adjustment is reflected in HECO T-11 update submitted by Ms. Nanbu.

2. Safety, Security and Facilities: The reduction of one position was explained in direct testimony, HECO T-15, page 6.
 3. Workforce Staffing and Development ("WFSD"): Due to limited resources, WFSD has not been able to complete the policies and procedures needed to establish and administer the planned corporate internship (two positions) and corporate mentorship programs (three
-

positions) described in direct testimony, HECO T-15, pages 26 to 29. Consequently, the department has decided to hire its additional Organization Development Consultant, described in HECO T-15, page 29, first and have that position work on the two programs. An offer for the Organizational Development Consultant position was extended to an experienced mainland candidate on November 25, 2008 (see offer letter provided as Attachment 3) with a January 26, 2009 start date. The division is currently carrying out the post-offer hiring activities. The start of the two programs is now planned for April 2009. Therefore, WFSD removed the five positions from the months of January through March 2009 to reflect the positions being filled by April 2009. The corresponding labor expense adjustment is reflected in HECO T-11 update submitted by Ms. Nanbu.

4. Customer Technology Applications Division and Energy Services Department: As previously discussed in direct testimony, HECO T-15, pages 6-7, an adjustment was made to transfer one position from the Customer Technology Applications Division to the Energy Services Department. In addition, as also explained in HECO T-15, page 7, the Company has removed the five DSM employees whose costs are recovered through the DSM surcharge from the Energy Services Department's employee count. However, the department's employee count is updated to reflect the addition of a Senior Rate Analyst position that is needed to support the additional work arising from the HCEI Agreement such as the Photovoltaic ("PV") Host program, feed-in tariffs, revised net energy metering tariff, time-of-use ("TOU") rates to encourage off-peak charging of electric vehicles, interim TOU rates, lifeline rates, mandatory TOU rates and revenue decoupling. This position is currently in recruitment; the adjustments to labor expense for the Senior Rate Analyst are discussed in Ms. Nanbu's (HECO T-11) rate case update.

Another position, the SSP Manager, is also added and will be responsible for overall administration of the expanded SSP, which is envisioned to increase more than 10 times (see Mr. Alan Hee's (HECO T-10) rate case update). Because the SSP Manager's labor costs will be recovered from the DSM surcharge, an additional adjustment has been made to remove this position from the department's count, similar to other DSM incremental positions. This position is currently in recruitment. Further discussion of both positions is detailed in Mr. Alan Hee's (HECO T-10) rate case update.

5. Vice President, Customer Solutions: A Director, Special Projects, position has been added to the office of the Customer Solutions Vice President. This position is charged with the responsibility of formalizing the Company's efforts to implement demand response programs identified in the HCEI Agreement to maintain system reliability as the amount of renewable energy increases. The Director is also responsible for formalizing the Company's demand response strategy across the Customer Solutions process area and other process areas of the Company. Consequently, the position was filled on November 24, 2008. This position is described in further detail and the corresponding labor charges can be found in Mr. Alan Hee's (HECO T-10) rate case update.
6. Construction and Maintenance ("C&M"): C&M has updated its plans and now intends to hire an additional Resource Planner and has hired an additional Senior Construction Manager. Further details regarding these positions and changes may be found in Mr. Robert Young's (HECO T-8) rate case update.
7. System Operation: HECO has recently developed plans to establish an asset management function to provide input to the T&D O&M and capital budgets and maintenance work plans for the Energy Delivery process area. The establishment of such a function within the

department was not reflected in HECO's original 2009 test year. In order to implement this plan, the System Operation department will increase its employee count by five positions which eventually will be organized into a new Asset Management department. Three of the five Asset Management positions (a Manager, a Director, Asset Planning and a Program Manager) will be filled in December 2008. The remaining two positions (a Director of Asset Programs and another Program Manager) will be filled by June of 2009. The Asset Management program and the corresponding labor expense adjustment are explained in detail in Mr. Robert Young's (HECO T-8) rate case update.

8. Energy Projects: In order for HECO to meet its HCEI commitments, the Energy Projects Department will hire two additional Senior Technical Services Engineers, beginning July 2009. One of the two Senior Technical Services Engineers will be assigned to the PV Host program. PV Host program is one of the initiatives identified in the HCEI Agreement and an application to the PUC for approval of this program will be filed by March 31, 2009. The site assessment work will begin in 2009 with implementation starting as soon as Commission approval is received. This engineer will be required to conduct site assessments, develop bid specifications for PV developers, evaluate proposals, oversee construction, and monitor the PV system performance. Energy Projects Department's existing staff is fully allocated to other projects and without this new position the PV Host program will not have sufficient resources to meet its aggressive schedule and the expected customer demand for participation. The corresponding labor expense adjustment for the position is discussed by Mr. Dan Giovanni (HECO T-7) in his rate case update.

The second Senior Technical Services Engineer will assist with development of distributed generation ("DG") projects, evaluate DG technologies (whether combustion

turbine or large diesel-generators), prepare bid drawings and specifications, conduct bid evaluations and construction monitoring, implement startup, and evaluate operations of the DG units. DG units will provide additional quick start generating capacity on Oahu to allow integration of intermittent wind energy into the HECO system. This engineer will work on the development of DG units at a number of potential sites, including at military bases.

The Naval Facilities Engineering Command intends to issue one or more requests for proposals seeking the development of DG units on several Oahu military bases. HECO plans to participate in these processes and anticipates that a formal proposal will be submitted for at least one military DG project in mid-2009. In 2009, the labor expense for this position will be charged to a clearing account for preliminary engineering for the military DG project. Accordingly, these charges will not be reflected in the O&M expenses. At a later point in time, the preliminary engineering charges will be transferred to a capital account for the military DG project, and these charges will be reflected as capital expense. As stated earlier, both positions are not planned to be filled until July 2009.

9. General Accounting: The General Accounting department has increased its original test year count by a Lead Corporate Accountant position, beginning in April of 2009. This position is needed to meet HECO's HCEI Agreement commitments as explained in detail in Ms. Patsy Nanbu's (HECO T-11) rate case update.
10. Management Accounting and Financial Services ("MAFS"): MAFS has also increased its original test year count by one additional Senior Financial Analyst, beginning May 2009, in order to meet HECO's HCEI Agreement commitments. The need for the additional Senior Financial Analyst is based on the projected increase in workload which will include supporting rate cases and other regulatory proceedings dealing with changes in ratemaking,

new surcharge mechanisms,² new independent purchase power ("IPP") contracts, the evaluation of the bids to HECO Renewable Energy RFP and the MECO RFP, and various new projects (including advanced metering infrastructure ("AMI"), PV Host, interisland cabling, biofuel refinery, asset management, renewable energy credit ("REC") valuation and trading, rate restructuring, financing, and feed-in tariff rates). A copy of the JVN for this position is included as Attachment 4. The corresponding labor expense adjustment for this position is discussed by Ms. Patsy Nanbu (HECO T-11) in her rate case update.

11. Customer Service: The Customer Service Department will be adding a Billing Clerk in March 2009 to handle the additional workload for the SSP. Labor costs for this position will be recovered from the DSM surcharge. Therefore, an additional adjustment has been made to remove the position from the department's test year count. The SSP, associated staffing requirements and corresponding labor expense adjustments are explained in detail in Mr. Alan Hee's (HECO T-10) rate case update.
12. President's Office: The President's Office has reduced its position count by one to recognize the recent transfer of the Director of Strategic Initiatives position and its responsibilities to the new Corporate Planning Department (explained below). The corresponding labor expense adjustment is reflected in HECO T-11 update submitted by Ms. Nanbu.
13. Corporate Planning and Integrated Resource Planning ("IRP"): In the dynamic energy environment that the Hawaiian Electric Companies finds itself today, there is a strong need to

² The Clean Energy Infrastructure Surcharge may include transmission lines built, in significant part, to facilitate renewable energy development, inter-connection equipment, advanced metering infrastructure, battery storage, and other equipment to facilitate increased use of renewable energy. It may also include construction work in progress ("CWIP") in rate base treatment and may be expanded to have Oahu ratepayers pay for some of the cost burden of new renewable energy developments on the MECO and HELCO systems.

align corporate strategic plans with long-term energy resource planning and to assess and consider risk levels and risk management strategies in both strategic plans and daily utility operations. The Corporate Planning Department, combining existing Strategic Initiatives, Integrated Resource Planning ("IRP"), and a new Enterprise Risk Management function, has been established to ensure alignment of these three functions. In addition, with the signing of the HCEI Agreement in which the parties agree to end the current IRP process and replace it with a Clean Energy Scenario Planning ("CESP") process, the development and implementation of the CESP framework and process for HECO will fall under the Corporate Planning Department. The department will also work with staff at HELCO and MECO to support the CESP process at the respective companies. On page 16, two additional positions are reflected in this new organization: a Manager to lead the department and the Director of Strategic Initiatives position (which was transferred from the President's Office).

To facilitate the objective of creating greater alignment of corporate strategies with long-term resource plans and to replace the IRP process with the CESP process, the IRP Division will be eliminated, and all six positions in the existing division will be reassigned to the Corporate Planning Department, along with the one Director of Strategic Initiatives position from the President's Office. This new department will be staffed with a new Manager of Corporate Planning, two directors of Corporate Planning, four senior corporate planners supporting all department functions, and one administrative assistant. This staffing level combines the number of positions currently dedicated to Strategic Initiatives and IRP, and results in a net increase of one position (for the Corporate Planning Manager to lead the department). The Corporate Planning Manager's position was filled on August 11, 2008; a

copy of the CPS for the Manager's transfer is included as Attachment 5. The corresponding labor expense adjustment is reflected in HECO T-11 update submitted by Ms. Nanbu.

14. Power Supply Services: To address the growing number of IPP proposals and the expected acceleration of this growth due to the HCEI Agreement, a new Renewable Energy Power Purchase Negotiations Division will be created within Power Supply Services. A Director will be hired in January to lead and coordinate the activities of the division. The Director will be responsible for the more than fifteen active negotiations in progress and all new Renewable Energy Purchase power contract negotiations (all islands). The Director will also hire two Negotiators by March to conduct the actual negotiations of renewable energy power purchase contracts, one of which will be filled by transferring a staff member from another division within the department. Because this position will not be backfilled, the department will increase by only two positions, the Director and the second Negotiator. These positions and associated costs are explained in further detail by Mr. Dan Giovanni (HECO T-7) in his rate case update.
15. Power Supply Engineering: An additional Project Manager position has been added to the Project Management Division in the Power Supply Engineering Department based on a forecasted sustained increase in the project management workload associated with the projects, programs and studies required to fulfill the HECO commitments made in the HCEI Agreement. This position was filled on October 27, 2008. The position and associated costs are explained in further detail by Mr. Dan Giovanni (HECO T-7) in his rate case update.
16. System Planning: The HCEI Agreement has dramatically increased the overall work demand by its focus on integrating up to 400 MW of wind energy into the Oahu grid via IPP projects located on the neighbor islands. In the System Planning Department, a new Renewable

Energy Planning Division will be established to conduct the planning needed to meet the aggressive progress milestones and accelerated deadlines for project development and integration. The four new positions in the new Renewable Energy Planning Division are as follows: Director, Renewable Energy Planning; Senior Renewable Energy Engineer; and two Renewable Energy Engineers. These positions and associated expenses are explained in further detail by Mr. Dan Giovanni (HECO T-7) in his rate case update.

17. Senior Executive Vice President/Chief Operating Officer's ("SEVP/COO") Office: As explained in direct testimony, HECO T-15, pages 20-21, the SEVP/COO's office was established to oversee day-to-day utility operations to enable the HECO President and CEO to place additional focus on strategic planning. HECO has reevaluated the need for this position, given the establishment of the Corporate Planning Department (described above) to align corporate strategic plans with long-term energy resource planning. Therefore, this office has been eliminated, reducing the staffing count by two. The corresponding labor expense adjustment is reflected in HECO T-11 update submitted by Ms. Nanbu.

In summary, the Company's updated test year average totals 1,636 as shown on page 16 and the Company's updated test year EOY total is 1,641 as shown on both pages 16 and 17.

UPDATES TO THE EMPLOYMENT MARKET AND RECRUITMENT INITIATIVES

Since HECO filed its original rate case application earlier this year, the overall economy and employment climate has changed dramatically, and HECO anticipates having less difficulty in filling positions described in direct testimony and this update with qualified candidates.

Factors that will help HECO reduce the gap of unfilled positions in 2009 are provided below.

- A. While Hawaii's unemployment rate is still lower than most states, it jumped from 2.7 percent in 2007 as stated in HECO T-15, page 11, to 4.5 percent in October 2008. (Refer to <http://www.bls.gov/news.release/laus.nr0.htm> released November 21, 2008, for the current unemployment rate for Hawaii). This higher level of unemployment in Hawaii and on the mainland may lead to more candidates to fill vacancies. An indication of this is the recent recruitment and acceptance of the Organizational Development Consultant position in WFSD by a candidate from the mainland.
- B. Another indication of the increasing demand for jobs in Hawaii was the HECO-sponsored career fair for engineering and technology professionals, held on November 20, 2008, which attracted over 200 interested individuals and, as shown below, resulted in a number of potential candidates for many of its vacancies.

<u>Profession</u>	<u>% of Attendance</u>	<u>Number of Resumes Received</u>
Engineers	46%	76
Information Technology	41%	67
Other	13%	22

The resumes are currently being reviewed for job matches.

- C. As stated in HECO T-15, page 15, HECO participated in the development of the Process Technology Program at Leeward Community College in partnership with the community college and other companies. In December, the first group of students will be graduating, and HECO anticipates it will hire two to three of the graduates to fill entry-level plant operator vacancies.

- D. In an effort to find ways to accelerate the hiring process, HECO's WFSD recently sponsored a brown bag webinar for supervisory employees on how to conduct portions of the job interview process themselves rather than having the Human Resources ("HR") department support all aspects of the job interview. Participants were guided through reviewing resumes and applications to help them identify qualified candidates and, as necessary, determine follow up questions to be asked in the job interview. In addition, they were shown tools that would enable them to conduct interviews and verbal reference checks in a lawful manner. By doing so, departments can avoid delays of one to two weeks of waiting for HR support. The webinar has been recorded for future viewing by those who missed it and those who may be new to hiring in the future.
- E. Finally, with regard to employee retention which will reduce the number of vacancies, HECO is also experiencing fewer retirements as the financial market uncertainty and its impact on nest eggs have led to a deferral of retirement by eligible employees. As shown below, over the past few years, the number of actual retirements has been significantly below projected retirements and will require HECO to revise its method of calculating retirement projections. In fact, the number of retirements in 2008 is expected to be at its lowest since 2000 with only approximately 18 of 63 projected to retire this year. While there are many reasons why employees choose not to retire, the economic conditions of recent months is certainly a component in this decision.

Retirement Activity

<u>Year</u>	<u>Projected*</u>	<u>Actual Retirements</u>
2000	47	66
2001	49	39
2002	49	40
2003	45	42
2004	53	52
2005	57	33
2006	51	25
2007	58	30
2008	63	15 YTD; 3 more anticipated
*Based on historical retirement rates of specific age groups applied to the current and future workforce.		

With all these factors described above, HECO is now filling its positions in a more timely basis as indicated by the table below.

<u>Date</u>	<u>Actual Employee Headcount</u>	<u>Budgeted Employee Headcount</u>	<u>% Actual/ Budgeted</u>
9/30/2006	1,430	1,571	91.02%
12/31/2006	1,449	1,572	92.18%
3/31/2007	1,449	1,541	94.03%
6/30/2007	1,486	1,542	96.37%
9/30/2007	1492	1,548	96.38%
12/31/2007	1,492	1,548	96.45%
3/31/2008	1,501	1,567	95.79%

6/30/2008	1,527	1,569	97.32%
7/31/2008	1,530	1,576	97.08%
9/30/2008	1,515	1,576	96.13%
10/31/2008	1,523	1,577	96.58%

However, HECO recognizes that, as of this update, the actual employee count is significantly below the January 2009 test year staffing count of 1,625 and, realistically, it will not be achieved.³ Although HECO is aggressively pursuing filling its vacancies, many of the HCEI positions are “pioneering” positions in renewable energy for Hawaii and may be difficult to fill for lack of experienced candidates. With the exception of Power Supply Operations and Maintenance (“PSOM”), work impacted by any shortfall in staffing will likely be temporarily delayed or supported by uncompensated exempt over time. (PSOM will cover shortfalls by increasing the amount of supplemental labor (e.g., contract services) as they have done in the past.) In recognition of the anticipated difference between the actual and test year staffing levels, HECO proposes an adjustment which decreases the test year average employee count by 27 employees and reduces the test year O&M labor expense by \$1,230,000. Anticipated test year payroll taxes and employee benefits were also reduced by \$102,000 and \$397,000, respectively (see Attachment 6 for the calculation of these test year expense reductions). These test year expense reductions totaling \$1,729,000 are reflected in the results of operations as submitted in the HECO T-23 update.

³ Actual staffing count as of October 31, 2008 is 1,523.

Hawaiian Electric Company, Inc.
Updated 2009 Test Year Average Calculation
Updated HECO-WP-1501

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Dept	Jan-09	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Total		Test Year Average	
Comp & Ben	11	11	11	11	11	11	11	11	11	11	11	11	11	143	11.00	11	
Ind Rel	9	9	9	9	9	9	9	9	9	9	9	9	9				
Upd Adjustment	1	1	1	1	1	1	1	1	1	1	1	1	1	130	10.00	10	
SSF	53	53	53	53	53	53	53	53	53	53	53	53	53				
Adjustment	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	676	52.00	52	
VP-Corp Exc	5	5	5	5	5	5	4	4	4	4	4	4	4	4	58	4.00	4
WFSD	25	25	25	25	25	25	25	25	25	25	25	25	25				
Upd Adjustment	-5	-5	-5	-5										305	23.46	23	
	98	98	98	98	103	103	102	102	102	102	102	102	102		100		
Corp Comm	9	9	9	9	9	9	9	9	9	9	9	9	9	117	9.00	9	
VP-Corp Rel	3	3	3	3	3	3	3	3	3	3	3	3	3	39	3.00	3	
	12	12	12	12	12	12	12	12	12	12	12	12	12		12		
CustTechAp	10	10	10	10	10	10	10	10	10	10	10	10	10				
Tsf to Engy Svcs	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	117	9.00	9	
Engy Svcs	19	19	19	19	19	19	19	19	19	19	19	19	19				
Rcv from CustTech	1	1	1	1	1	1	1	1	1	1	1	1	1				
Less DSM	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5	-5				
Upd Adjustment	1	1	2	2	2	2	2	2	2	2	2	2	2				
Upd Less SSP			-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	208	16.00	16	
Fcst&Res	10	10	10	10	10	10	10	10	10	10	10	10	10	130	10.00	10	
IRP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	0	
Mktg Svcs	12	12	12	12	12	12	12	12	12	12	12	12	12	156	12.00	12	
VP-Cust Sol	2	2	2	2	2	2	2	2	2	2	2	2	2				
Upd Adjustment	1	1	1	1	1	1	1	1	1	1	1	1	1	39	3.00	3	
	50	50	50	50	50	50	50	50	50	50	50	50	50		50		
C&M	220	220	220	220	220	220	220	220	220	220	220	220	220				
Upd Adjustment	2	2	2	2	2	2	2	2	2	2	2	2	2	2886	222.00	222	
Engineering	85	85	85	85	85	85	85	85	85	85	85	85	85	1105	85.00	85	
Supp Svcs	85	85	85	85	85	85	85	85	85	85	85	85	85	1105	85.00	85	
Sys Op	118	118	118	118	118	118	118	118	118	118	118	118	118				
Upd Adjustment	3	3	3	3	3	3	5	5	5	5	5	5	5	1587	122.08	122	
VP-En Del	2	2	2	2	2	2	2	2	2	2	2	2	2	26	2.00	2	
	515	515	515	515	515	515	517	517	517	517	517	517	517		518		
CID	55	55	55	55	55	55	55	55	55	55	55	55	55	715	55.00	55	
Engy Proj	9	9	9	9	9	9	9	9	9	9	9	9	9				
Upd Adjustment								2	2	2	2	2	2	129	9.92	10	
SVP-EnSol	4	4	4	4	4	4	4	4	4	4	4	4	4	52	4.00	4	
Tech	3	3	3	3	3	3	3	3	3	3	3	3	3	39	3.00	3	
	71	71	71	71	71	71	71	73	73	73	73	73	73		72		
Gen Acctg	27	27	27	27	27	27	27	27	27	27	27	27	27				
Upd Adjustment					1	1	1	1	1	1	1	1	1	360	27.69	28	
InfoTech	97	97	97	97	97	97	97	97	97	97	97	97	97	1261	97.00	97	
MAFS	22	22	22	22	22	22	22	22	22	22	22	22	22				
Upd Adjustment						1	1	1	1	1	1	1	1	294	22.82	23	
RiskMgt	9	9	9	9	9	9	9	9	9	9	9	9	9	117	9.00	9	
SVP Finance & Admin	3	3	3	3	3	3	3	3	3	3	3	3	3	39	3.00	3	
	158	158	158	158	159	160	160	160	160	160	160	160	160		160		
Legal & Land	17	17	17	17	17	17	17	17	17	17	17	17	17	221	17.00	17	
VPGen	2	2	2	2	2	2	2	2	2	2	2	2	2	26	2.00	2	
	19	19	19	19	19	19	19	19	19	19	19	19	19		19		
Ed & Cons Aff	8	8	8	8	8	8	8	8	8	8	8	8	8	104	8.00	8	
Reg Affairs	15	15	15	15	15	15	15	15	15	15	15	15	15	195	15.00	15	
VP-Gov & Com	7	7	7	7	7	7	7	7	7	7	7	7	7	91	7.00	7	
	30	30	30	30	30	30	30	30	30	30	30	30	30		30		
Cust Svc	148	148	148	148	148	148	148	148	148	148	148	148	148				
Upd Adjustment				1	1	1	1	1	1	1	1	1	1				
Upd Less SSP				-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	1924	148.00	148	
SVP-Oper	2	2	2	2	2	2	2	2	2	2	2	2	2	26	2.00	2	
	150	150	150	150	150	150	150	150	150	150	150	150	150		150		
CorpAudComp	11	11	11	11	11	11	15	15	15	13	13	13	13	183	12.54	13	
President	4	4	4	4	4	4	4	4	4	4	4	4	4				
Upd Tsf to Corp Planning	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	39	3.00	3	
	14	14	14	14	14	14	18	18	18	16	16	16	16		16		
Corp Planning (NEW)	1	1	1	1	1	1	1	1	1	1	1	1	1				
Upd Rcv from Pres Ofc	1	1	1	1	1	1	1	1	1	1	1	1	1				
Upd Rcv from IRP	6	6	6	6	6	6	6	6	6	6	6	6	6	104	8.00	8	
Gov Rel	3	3	3	3	3	3	3	3	3	3	3	3	3	39	3.00	3	
IRP	6	6	6	6	6	6	6	6	6	6	6	6	6				
Upd Tsf to Corp Planning	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	-6	0	0.00	0	
EVP-Pub Aff	2	2	2	2	2	2	2	2	2	2	2	2	2	26	2.00	2	
	13	13	13	13	13	13	13	13	13	13	13	13	13		13		
Environ	25	25	25	25	25	25	25	25	25	25	25	25	25	325	25.00	25	
Pwr Sup O&M	375	375	375	375	375	375	375	375	375	375	375	375	375	4875	375	375	
Pwr Sup Services	15	15	15	15	15	15	15	15	15	15	15	15	15				
Upd Adjustment	1	1	1	2	2	2	2	2	2	2	2	2	2	218	16.77	17	
PwrSup Eng	52	52	52	52	52	52	52	52	52	52	52	52	52				
Upd Adjustment	1	1	1	1	1	1	1	1	1	1	1	1	1	689	53.00	53	
Sys Planning	22	22	22	22	22	22	22	22	22	22	22	22	22				
Upd Adjustment	1	1	1	3	4	4	4	4	4	4	4	4	4	328	25.23	25	
VP-Pwr Sup	3	3	3	3	3	3	3	3	3	3	3	3	3	39	3.00	3	
	495	495	495	498	499	499	499	499	499	499	499	499	499		498		
SrEVP	2	2	2	2	2	2	2	2	2	2	2	2	2				
Upd Adjustment	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	0	0.00	0	
	0	0	0	0	0	0	0	0	0	0	0	0	0		0		
Test Year Counts	1625	1625	1625	1628	1635	1636	1641	1643	1643	1641	1641	1641	1641			1636	

*Employee counts include interns and temporary employees on HECO payroll, but exclude employees covered under the DSM surcharge adjustment docket from all years

Hawaiian Electric Company, Inc.
UPDATED HECO-1503 Summary Recorded and Average Number of Employees

	2006 Recorded EOY	2006 Year Average	2007 Recorded EOY	2007 Year Average	2008 YTD Recorded 10/31/08	2008 EOY Budget	Updated 2008 Projected EOY	Updated 2009 EOY Test Year	Updated 2009 Test Year Average
President's Office									
Corporate Audit & Compliance (Formerly Internal Audit)	10	11	9	10	11	11	12	13	13
President's Office	2	3	3	3	1	3	1	3	3
Subtotal	12	14	12	13	12	14	13	16	16
Sr. Exec VP					0	0	0	0	0
VP-Corporate Excellence									
Compensation & Benefits	13	13	10	12	11	11	11	11	11
Industrial Relations	9	9	9	8	10	9	10	10	10
Safety, Security & Facilities	42	45	47	44	46	51	51	52	52
Workforce Staffing & Development	16	16	17	17	17	18	17	25	23
VP-Corporate Excellence's Office	2	2	4	3	5	5	5	4	4
Subtotal	82	85	87	84	89	94	94	102	100
SVP-Finance & Administration									
General Accounting	26	26	26	25	26	26	27	28	28
Information Technology & Services	95	93	89	92	92	94	95	97	97
Management Accounting & Fin Svcs	22	22	20	21	22	22	21	23	23
Risk Management	9	9	9	9	9	9	9	9	9
Sr. VP Finance & Administration's Office	4	3	3	4	3	3	3	3	3
Subtotal	156	153	147	151	152	154	155	160	160
VP-General Counsel									
Legal/Land and Rights of Way	16	16	15	16	17	18	17	17	17
VP-Gen Counsel's Office	2	2	2	2	2	2	2	2	2
Subtotal	18	18	17	18	19	20	19	19	19
Sr. VP-Energy Solutions									
Customer Installations	44	47	50	46	52	53	50	55	55
Energy Projects	8	8	9	9	9	9	9	11	10
Technology	3	3	3	3	3	3	3	3	3
Sr. VP-Energy Solutions' Office	4	4	4	4	4	4	4	4	4
Subtotal	59	62	66	62	68	69	66	73	72
VP-Customer Solutions*									
Customer Technology Applications	8	8	9	9	9	9	9	9	9
Energy Services*	17	16	12	11	13	13	12	16	16
Forecasts & Research	9	10	10	10	10	10	10	10	10
Integrated Resource Planning	6	5	Moved to EVP Public Affairs as of 3/15/07						
Marketing Services	11	11	11	12	11	12	11	12	12
VP-Customer Solutions' Office	2	2	2	2	2	2	3	3	3
Subtotal	53	52	44	44	45	46	45	50	50
Sr. VP-Operations									
Customer Service	126	127	136	132	140	147	142	148	148
Sr. VP-Operations' Office	3	3	2	2	2	2	2	2	2
Subtotal	129	130	138	134	142	149	144	150	150
VP-Energy Delivery									
Construction & Maintenance	220	212	215	216	219	220	220	222	222
Engineering	84	85	83	86	83	88	83	85	85
Support Services	80	80	84	82	83	85	83	85	85
System Operation	105	108	114	110	114	118	115	123	122
VP-Energy Delivery's Office	2	2	2	2	2	2	2	2	2
Subtotal	491	487	498	496	501	513	503	517	516
VP-Power Supply									
Environmental	22	22	24	22	23	24	25	25	25
Power Supply Engineering (formerly Planning & Engineering)	40	38	46	44	48	47	48	53	53
Power Supply Operations & Maintenance	316	307	333	326	338	354	344	375	375
Power Supply Services	28	29	13	12	15	15	14	17	17
System Planning	0	0	19	19	19	22	19	26	25
VP-Power Supply's Office	2	2	2	2	3	2	3	3	3
Subtotal	408	398	437	425	446	464	453	499	498
VP-Special Projects	3	3	Special Projects Department dissolved in January of 2007						
Exec. VP-Public Affairs									
Corporate Planning (Est. 8/11/08)					6	0	7	8	8
Governmental Relations	2	3	3	3	2	3	3	3	3
Integrated Resource Planning			5	5	0	6	Move to Corporate Planning		
EVP-Public Affairs' Office	3	2	3	3	2	3	2	2	2
Subtotal	5	5	11	11	10	12	12	13	13
VP-Corporate Relations									
Corporate Communications	8	12	9	8	9	10	9	9	9
VP-Corporate Relations' Office	3	2	3	3	3	3	3	3	3
Subtotal	11	14	12	11	12	13	12	12	12
VP-Government & Community Affairs									
Education & Consumer Affairs	8	8	8	7	8	8	8	8	8
Regulatory Affairs	7	7	9	9	12	15	14	15	15
VP-Gov't & Comm Affairs' Office	7	7	7	7	7	7	7	7	7
Subtotal	22	22	24	23	27	30	29	30	30
Company Total	1448	1443	1493	1472	1523	1578	1545	1641	1638

*Employee counts include interns and temporary employees on HECO payroll, but exclude employees covered under the DSM surcharge adjustment docket from all years.

Summary of Staffing Attachments
and the Status of New Positions

Attachment #	Update Discussion #	Department	Position Title	Status	Documentation Description
2	1	Industrial Relations	Industrial Relations Consultant	Filled 9/08/08	Change in Personnel Status (CPS) form
3	3	Workforce Staffing and Development	Organizational Development Consultant	Conditional offer accepted; undergoing post-hiring activities	Offer letter
	4	Energy Services	Senior Rate Analyst	Approved to fill; in recruitment	Refer to HECO T-10 Rate Case Update
	4	Energy Services	Solar Saver Program Manager	Approved to fill; in recruitment	Refer to HECO T-10 Rate Case Update
	5	Vice President, Customer Solutions	Director, Special Projects	Filled 11/24/08	Refer to HECO T-10 Rate Case Update
	6	Construction & Maintenance	Resource Planner	Approved to fill; in recruitment	Refer to HECO T-8 Rate Case Update
	6	Construction & Maintenance	Senior Construction Manager	Filled 10/27/08	Refer to HECO T-8 Rate Case Update
	7	System Operation	Manager, Asset Management	Approved to fill	Refer to HECO T-8 Rate Case Update
	7	System Operation	Director, Asset Planning	Approved to fill	Refer to HECO T-8 Rate Case Update
	7	System Operation	Program Manager	Approved to fill (second one will be filled in 06/09)	Refer to HECO T-8 Rate Case Update
	7	System Operation	Director, Asset Programs	Approved to fill 06/09	Refer to HECO T-8 Rate Case Update
n/a	8	Energy Projects	Sr. Technical Services Engineer	Not planned to fill until 07/09 (increase to # of an existing position)	n/a; position will not be filled until second half of 2009
	9	General Accounting	Lead Corporate Accountant	Approved to fill; in recruitment	Refer to HECO T-11 Rate Case Update
4	10	Mgmt Acctg & Financial Svcs	Senior Financial Analyst	Approved to fill; in recruitment	Job Vacancy Notice (JVN)

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ATTACHMENT 1
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	11	Customer Service	Billing Clerk	Not planned to fill until 03/09 (increase to # of an existing position)	n/a; position will not be filled until 03/09
5	13	Corporate Planning	Corporate Planning Manager	Filled 08/11/08	CPS
	14	Power Supply Services	Director, Renewable Energy Purchase Power	Approved to fill; in recruitment	Refer to HECO T-7 Rate Case Update
	14	Power Supply Services	Negotiator	Position Description in development	
	15	Power Supply Engineering	Project Manager	Filled 10/27/08	Refer to HECO T-7 Rate Case Update
	16	System Planning	Director, Renewable Energy Planning	Approved to fill	Refer to HECO T-7 Rate Case Update
	16	System Planning	Sr. Engineer, Renewable Energy Planning	Approved to fill	Refer to HECO T-7 Rate Case Update
	16	System Planning	Staff Engineer, Renewable Energy Planning	Approved to fill	Refer to HECO T-7 Rate Case Update

**CONFIDENTIAL EMPLOYEE
INFORMATION DELETED**

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ATTACHMENT 2
PAGE 1 OF 1

CHANGE IN PERSONNEL STATUS (New Hire)

For HR use only

Entered in Ellipse:

*Effective Date: 9/8/2008

Employee ID: [REDACTED]

Employee Name: [REDACTED]

Company: HAWAIIAN ELECTRIC COMPANY

Last Day on Payroll (For Terminations Only):

*Employment Category: AF REGULAR FULL-TIME

*Reason: NE NEW EMPLOYEE-NON-PROBATIONARY

	CURRENT	PROPOSED		CURRENT	PROPOSED
Position ID:		4581	Bargaining Unit:		
Job Code:		S2483	Hourly Rate:		
Position Title:		IR CONSULTANT	Grade:		
Department:		INDUSTRIAL RELATIONS	Appr Trng Hrs Comp:		
Division:		LABOR REL & WAGE ADMIN	Merit:		
*Mail Stop/Work Loc:		CP17	Role:		MT
RA:		PPI	*Base Salary:		[REDACTED]
*Reporting To:		Teri Kam	Market:		75,000
Award Code:		MERR	CTM:		[REDACTED]
Home Cost Center:		PPI098PHENDNPZZZZZZ	Increase/Decrease:		
*Labor Class:		TC	Variable Merit:		
*Primary Resource:		N/A	Time Frame From:		
*WO Prefix:		IR	Time Frame To:		
*Roster Pattern:		DK5D			
*Roster Position:		0001			

*JVR No: P2219

*Replacing: N/A

Comments: Addition due to increased workload.

Proposed Salary Offer Summary (For Utility Company Merit Positions Only)

1st Line Supv Differential:	no	5% + Increase (approval)	N/A	Date Approved:	N/A
Highest Paid BU EE Supervised	Position: N/A Rate: 0	Interim Increase (added to base)	Explanation: N/A		
Development Plan	Explanation: N/A	May Merit	Explanation: N/A		
Entry-level Engineer Plan	Explanation: N/A	September Market Adjustment	Explanation: N/A		
Signing Bonus (one time only - not in base)	Amount: 0 Charges: N/A SS#: N/A	Relocation	Terms: N/A		
OTHER:	N/A				
Reviewed by:					
WSD CONSULTANT / DATE		COMPENSATION / DATE			

APPROVALS

Teri Kam 9/5/08
SUPERVISOR / DATE

Michael Robinson 9/5/08
DEPARTMENT MANAGER / DATE

[Signature] 9/5/08
EXECUTIVE / DATE

9/5/2008 11:38:44 AM

CONFIDENTIAL EMPLOYEE
INFORMATION DELETED

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PAGE 02

Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001



November 25, 2008

Dear [REDACTED]

I am pleased to offer you the position of Consultant, Organizational Development in the Workforce Staffing and Development department of Corporate Excellence at a salary of [REDACTED] per annum, paid bi-weekly. This offer is contingent on your passing drug screening tests and review of your conviction record, if any.

The salary offer is at the fully qualified level of performance based on your knowledge, skills, and abilities. Because you are starting employment with HECO in the last quarter of the year, you will be first eligible for a merit adjustment in 2010.

In Organizational Development, we work with all process areas through the following programs: Corporate Culture Survey, Performance Development System, Succession Planning process, Leadership Development, and Learning and Development Training programs. You will have a hand in not only designing strategic programs that contribute to the learning and development for our employees, but be a part of changing and shaping the culture of our company.

We are looking forward to your being a part of our winning team: learn our business, embrace change, and desire to be the best.

Enclosed is a brief summary of the benefits you will receive as a Hawaiian Electric employee. If you would like to speak to someone about our company benefits, please contact Myra O'Brien, Benefits Administrator, at 543-4674. She will be happy to answer any questions you may have.

Please confirm your acceptance of this offer by returning the signed offer letter and completed Consent to Criminal Conviction Record inquiry. You will be contacted by Janel Matsuoka from HECO's Workforce Staffing and Development division to arrange for employment processing before you begin working. Should you have any questions, please call me at 543-4644. We look forward to having you join us at Hawaiian Electric.

Sincerely,

Kevin Imai
Director, Organizational Development
Workforce Staffing & Development

I accept the job offer as conditioned above. I understand that this letter is not considered to be an employment contract and is an offer for at-will employment.

CONFIDENTIAL EMPLOYEE
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PAGE 03

I will be available for work on January 26, 2009.



11/26/08
Date





Hawaiian Electric Company, Inc.
An Equal Opportunity/Affirmative Action Employer

JVR #: P2320
Application Deadline: 11/13/08

MERIT JOB VACANCY NOTICE

Position: Senior Financial Analyst
Role: Teacher/Coach
Number of Vacancies: One (1)
Department: Management Accounting & Financial Services
Division: Financial Analysis
Primary Work Location: King Street, 3rd Floor
Remarks:

Provides financial and economic analyses and understanding of complex transactions to decision-makers; recommends and implements appropriate economic analysis approaches throughout the Company.

Job Responsibilities:

- Prepares (or assists in the preparation of) and communicates the results of utility economic analysis of alternative proposals and investment decisions. Develops approaches for economic analysis of very complex transactions and/or alternatives with significant long-term financial impact; for example, purchase power contracts, large (multi-million dollar) capital investments, and alternative integrated resource plans. Ensures appropriate and consistent use of economic methods for evaluating alternatives. Represents the division on task forces and committees to provide financial insights and understanding for various projects.
- Prepares (or assists in the preparation of) and delivers testimony for PUC filings such as rate case and other large projects requiring PUC approval (e.g. purchase power contracts, large capital investments).
- Coordinates the analysis and communication of the economic effects of various accounting methods.

All positions open to external applicants will be listed on the
Employment Hotline at 543-4611 and at <http://careers.heco.com>.

WINNER OF THE EDISON AWARD
FOR DISTINGUISHED INDUSTRY LEADERSHIP



Do Not Remove from Bulletin Board Until Posting Expires. **Post on Bulletin Board From: 11/6/08-11/13/08**
Should you have any questions, please contact Workforce Staffing & Development at 543-4641 or 543-4620.



Hawaiian Electric Company, Inc.
An Equal Opportunity/Affirmative Action Employer

JVR #: P2320
Application Deadline: 11/13/08

Knowledge Requirements:

- Thorough knowledge of microeconomic and regulatory economics.
- Thorough knowledge of accounting and finance principles and practices.
- Working knowledge of corporate tax laws and regulations.
- Working knowledge of generation expansion planning, principles of electricity generation, and transmission and distribution planning desired.
- Working knowledge of personal computers and/or mainframe systems and related software applications such as, spreadsheets, word processing, etc.
- Working knowledge of regulatory processes.

Skills Requirements:

- Excellent business judgment - the ability to see beyond the obvious, to evaluate all knowledge and experience and to select the "right" course of action at the "right" time from a multitude of possibilities - and executive decision-making ability. In-depth analytical and computational skills. Ability to quickly separate the relevant from the irrelevant in gathering information, make reasonable assumptions, prepare accurate analyses, and reach sound conclusions. Accomplishes the aforementioned in an environment with few generally accepted guidelines, with potentially high consequences of error.
- Ability to apply and direct the application of specialized financial knowledge and general business knowledge to complex transactions.
- Highly developed interpersonal skills. Ability to work with individuals of different disciplines and management levels, within the Company and outside the Company. Ability to deal with sensitive, difficult or confrontational issues.
- Ability to remain flexible in a demanding work environment and adapt to rapidly changing priorities.
- Ability to develop long-term financial models, sensitivity analyses, and complex computations on spreadsheet or financial modeling software.
- Highly developed communication skills. Ability to effectively communicate complex concepts, calculations, and issues to audiences of varying knowledge and backgrounds in writing and verbally.
- Ability to comprehend and apply complex concepts quickly.

All positions open to external applicants will be listed on the
Employment Hotline at 543-4611 and at <http://careers.heco.com>.

WINNER OF THE EDISON AWARD
FOR DISTINGUISHED INDUSTRY LEADERSHIP



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Hawaiian Electric Company, Inc.
An Equal Opportunity/Affirmative Action Employer

JVR #: P2320
Application Deadline: 11/13/08

Experience Requirements:

- Multiple (5-7) years of financial analysis and accounting experience performing advanced work in the financial planning field. (Experience in public accounting or business credit analysis may be considered.)
- Several (3-5) years of utility experience relating to rate making, utility accounting or utility planning desired.

If there are no applicants with this experience, the company may consider applicants without such experience who meet the knowledge/skill requirements. If such an applicant is hired, he or she will initially be placed on a development plan commensurate with their education and experience level.

To Apply:

Any employee who meets the minimum requirements should apply on-line at Café BEST by clicking on the link below:

http://intranet/humanresources/jvns/jvn_eol_apply.asp?id=2736

(Should you have problems linking to the on-line application, please call 543-4641.)

Submittal of an application for the position:

1. *Authorizes HECO to share any and all information regarding previous or present employment, educational training or personal information from their records and from any other source with the hiring department or subsidiary company;*
2. *Releases and waives HECO from any and all liability for any damage which may be claimed as a result of furnishing such information to the hiring department or subsidiary company; and*
3. *Authorizes release and transfer of all personnel records to be maintained by the hiring company in the event of an inter-company transfer.*

NOTE: a) To the extent permitted by law, HECO may conduct a criminal conviction record inquiry for the past 10 years. b) HECO is an equal employment opportunity and affirmative action employer. We actively seek diversity among our employees. We do not discriminate on the basis of age, race, color, religion, gender/sex, national origin, ancestry, disability, marital status, arrest and court record, sexual orientation, veteran status, or other protected categories in accordance with state and federal laws. c) If you require accommodations during the application process, please contact Workforce Staffing & Development at 543-4641 or 543-4620.

All positions open to external applicants will be listed on the
Employment Hotline at 543-4611 and at <http://careers.heco.com>.

Do Not Remove from Bulletin Board Until Posting Expires.

Should you have any questions, please contact Workforce Staffing & Development at 543-4641 or 543-4620.

WINNER OF THE EDISON AWARD
FOR DISTINGUISHED INDUSTRY LEADERSHIP



Post on Bulletin Board From: 11/6/08-11/13/08

**CONFIDENTIAL EMPLOYEE
INFORMATION DELETED**

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PAGE 1 OF 1

CHANGE IN PERSONNEL STATUS (Transfer/Promotion)

XC: Payroll 8/26/08
For HR use only
Entered in Ellipse: 8/26/08 at

Employee ID: [REDACTED] Employee Name: [REDACTED] *Effective Date: 08/11/2008
Company: HAWAIIAN ELECTRIC COMPANY Last Day on Payroll (For Terminations Only):
*Employment Category: AF REGULAR FULL-TIME *Reason: TU TRANSFER-PROMOTION

	CURRENT	PROPOSED		CURRENT	PROPOSED
Position ID:	3014	5258	Bargaining Unit		
Job Code:	S2443	M243	Hourly Rate:		
Position Title:	DIR, STRATEGIC INITIATIVES	MGR, CORPORATE PLANNING	Increase/Decrease:		
Department:	PRESIDENTS OFFICE	CORPORATE PLANNING	Grade:		
Division:	PRESIDENTS OFFICE	ADMINISTRATION	Appr Trng Hrs Comp:		
*Mail Stop/Work Loc	KS4	KS4	Merit		
RA:	P9P	PLA	Role:	MFS	ME
*Reporting To:		Robert Alm	*Base Salary	[REDACTED]	[REDACTED]
Award Code:	MERR	MERE	Market:	102,700	127,900
Home Cost Center:	P9P098PHENDNP222222	PLA098PHENDNP222222	CTM:	[REDACTED]	[REDACTED]
*Labor Class:	F	E	Increase/Decrease:		[REDACTED]
*Primary Resource:		N/A	Variable Merit:	0	N/A
*WO Prefix:	AD	AD	Time Frame From:		N/A
*Roster Pattern:	DK5D	DK5D	Time Frame To:		N/A
*Roster Position:	0001	0001			

† No: P2228

*Replacing: new position

Comments: N/A

Proposed Salary Offer Summary (For Utility Company Merit Positions Only)

1st Line Supv Differential	no	5% + increase (approval)	Approved	Date Approved: 8/4/08
Highest Paid BU EE Supervised	Position: n/a Rate: n/a	Interim Increase (added to base)	Explanation: n/a	
Development Plan	Explanation: n/a	May Merit	Explanation: [REDACTED]	
Entry-level Engineer Plan	Explanation: n/a	September Market Adjustment	Explanation: n/a	
Signing Bonus (one time only - not in base)	Amount: 0 Charges: n/a SS#: n/a	Relocation	Terms: n/a	
OTHER: n/a				
Reviewed by:				
WSD CONSULTANT / DATE			COMPENSATION / DATE	

APPROVALS

SUPERVISOR / DATE

DEPARTMENT MANAGER / DATE

EXECUTIVE / DATE

8/18/2008 10:04:52 AM

PROPOSAL TO ADJUST REVENUE REQUIREMENT

HECO recognizes the challenges it faces in meeting its test year employment headcount of 1,625 in January 2009 when its year-end 2008 projection is 1,545, a difference of 80. Therefore, based on the methodology described below, HECO is proposing a one-time revenue requirement adjustment of \$1,729,000 for the 2009 test year, including labor expense and adjustments for payroll taxes and employee benefits. This is based on a regression analysis that predicts actual employee headcount.

Description of the Regression Analysis Used

In an attempt to adjust its revenue requirement in a logical and reasonable manner, HECO looked at its employment data and found that, over time, HECO's actual headcount has been steadily approaching its budgeted headcount. Based on this trend, HECO used a time series regression analysis of the percentage of actual to budgeted employee headcount to predict the percentage for the 2009 test year and then to convert this to predicted employee headcount for 2009.¹

For this analysis, HECO used the percentage of actual versus budgeted non-Power Supply Operations and Maintenance ("PSOM") employee headcount over the time period from September 2006 through October 2008.² A nonlinear, natural log function was used as the best fit and implies increasing accuracy over time. (A linear relationship was reviewed

¹ For the merits of using regression analysis, see Pindyk, Robert S. and Rubinfeld, Daniel L. 1981, Econometric Models and Economic Forecasts, New York: McGraw-Hill.

² The Company did not consider PSOM employees in this adjustment as this department covers shortfalls by increasing its supplemental workforce (e.g., contract services). Also, monthly data was not readily available, so the numbering system as shown on page 8 of this attachment was used to indicate the month in the time series.

but not used as it resulted in a lower R^2 when compared to the nonlinear regression.³⁾ The logarithmic function used is as follows:

$$y = \beta_0 + \beta_1 * \ln(x) \quad \text{where}$$

x (the independent variable) is the time period,

y (the dependent variable) is the percentage of actual versus budgeted non-PSOM employees, and

β_0 and β_1 are the unknown coefficients.

The time series data used for the dependent and independent variables can be found on page 7 of this attachment.

Using this time series data of budgeted and actual employee headcount, the following regression equation was estimated:

$$y = 0.9183 + 0.0164 * \ln(x)$$

$$R^2 = 0.7794$$

$$t \text{ stat} = 5.6397$$

The statistical results shown above validates that this regression equation is a best fit function and is significant at the 99 percent confidence level.⁴

The resulting regression equation can be interpreted as follows:

- There is a high predictive value in the model, confirming that it is accurate, and as time goes on and additional headcount are budgeted and implemented, the time period estimate gets better.

³ The R^2 statistic measures how well a regression line approximates actual data points. The linear function resulted in an R^2 of .693; the logarithmic function's R^2 improved to .7794.

⁴ The P-value of 0.0003 shown on page 9 of this attachment confirms this.

- The percent of actual to budgeted headcount in the model starts at 92 percent (91.83 percent, which is the constant, β_0) and gets better over time.
- The prediction of the model is that the estimate will improve by 1.64 percent for a unit change in $\ln(x)$ and it is a statistically significant predictor.

The results of the regression analysis are shown on page 8 of this attachment.

Factors Used to Reduce Labor Expenses and Revenue Requirement

Using the regression equation, HECO calculated the estimated percentages of actual versus budgeted for the 2009 test year (see page 9 of this attachment). Using these percentages and the test year update of non-PSOM employee headcount (from HECO-WP-1501 of the HECO T-15 rate case update) as the budgeted headcount for 2009, HECO derived an estimated headcount for the 2009 test year (see also page 9 of this attachment). A comparison of the average estimated non-PSOM employees in 2009 (1,111 employees) as developed by the regression equation and the average test year update non-PSOM employees (1,138 employees) yields a difference of 27 employees, or 2.37 percent. Based on this percent difference, HECO reduced its test year labor expenses, payroll taxes and based on the headcount difference, reduced its test year employee benefits. The results appear on page 5 of this attachment and are explained below.

To reduce labor expenses, HECO applied the 2.37 percent to the test year update non-PSOM labor expenses of \$51.9 million. This provides an estimated reduction in labor expenses of \$1,230,000 (\$51,874,000 x 2.37 percent). See page 5 of this attachment for a breakdown by block of accounts.

In addition to reduced labor expenses, HECO also reduced associated adjustments for employee payroll taxes and employee benefits. The payroll tax rate of 8.29 percent (see page 6 of this attachment) was applied to the labor expense reduction of \$1,230,000. This was estimated to be \$102,000 ($\$1,230,000 \times 8.29$ percent – see page 5).

Employee benefits were also included in the calculation of the revenue requirement reduction. HECO estimates total 2009 test year employee benefits at \$23,771,000 (see HECO T-13 update, Attachment 1). With total covered employees for the 2009 test year estimated at 1,618, on average, for the 2009 test year (see HECO T-13 update, Attachment 9), the employee benefit costs per covered employee is approximately \$14,700 ($\$23,771,000 / 1,618$).⁵ With the total adjustment for employee headcount of 27, the impact of this reduction on employee benefits is \$397,000 ($\$14,700 \times 27$ employees).

Taking all this into consideration, the total revenue requirement adjustment estimate attributed to this employee headcount reduction is \$1,729,000 and is summarized as follows:

Labor expense	\$1,230,000
Payroll tax	\$102,000
Employee benefits	\$397,000
Total revenue requirement reduction	\$1,729,000

All workpapers that support this revenue requirement adjustment are provided on pages 5 through 9.

⁵ See page 6 of this attachment.

SUMMARY OF ADJUSTMENT ATTRIBUTED TO A REDUCTION IN HEADCOUNT
(T&D, Customer Acct., Customer Svc and A&G)

Block of Accounts, Less PSOM A	Labor Expense (Note 1) B	Labor Expense Reduction Using Factor (Note 2) C=B*-2.37%	Payroll Tax Reduction (Note 3) D=C*8.29%	Employee Benefits Reduction (Note 4) E=(B/Total)*397	Total Expense Reduction F=C+D+E
Transmission	\$ 5,068	\$ (120)	\$ (10)	\$ (39)	
Distribution	\$ 12,717	\$ (302)	\$ (25)	\$ (97)	
Customer Accounts	\$ 8,102	\$ (192)	\$ (16)	\$ (62)	
Customer Service	\$ 3,470	\$ (82)	\$ (7)	\$ (27)	
Administrative & General	\$ 22,517	\$ (534)	\$ (44)	\$ (172)	
Total	\$ 51,874	\$ (1,230)	\$ (102)	\$ (397)	\$ (1,729)

Note 1: See HECO T-8 update, HECO-809; HECO T-9 update, HECO-901; HECO T-10 update, HECO-1005; HECO T-11 update, HECO-1101.

Note 2: See Model tab. Percent difference between predicted average using model v. 2009 test year average (13-mo. ave.): -2.37%

Note 3: See next page for support 8.29%

Note 4: See next page for support. \$ 14.7

Difference between predicted average using model v. 2009 test year, 13-mo. ave. # of employees -27

Total employee benefits reduction allocated among accounts (see Model tab) Total reduction \$ (397)

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Hawaiian Electric Co., Inc.
Overall Labor Adjustment
Employee Benefits and Payroll Tax Factors

<u>Line #</u>	<u>Description</u>	<u>Amount</u>	<u>Reference</u>
1	A&G - Employee Benefits	\$ 23,771,000	Rate Case Update HECO T-13, Attachment 1, page 1
2	Average Number of Employees Covered for Group Insurance Plans	<u>1,618</u>	Rate Case Update HECO T-13, Attachment 9
3	Estimated Benefit Cost per Employee (Ln 1/Ln2)	<u>\$ 14,700</u>	
<hr/>			
1	Payroll Taxes Charged to Operations	\$53,090.13	Rate Case Update HECO T-11, Attachment 4, page 3 Rate Case Update HECO T-16, Attachment 1
2	Total Direct Labor Costs (note a)	<u>\$640,575.76</u>	Rate Case Update HECO T-11, Attachment 4, page 3
3	Payroll Tax Factor (Ln 1/Ln 2)	<u>8.29%</u>	

Note (a): Represents the direct labor costs only for O&M expenses that are associated with the staffing changes identified in Rate Case Update HECO T-15.

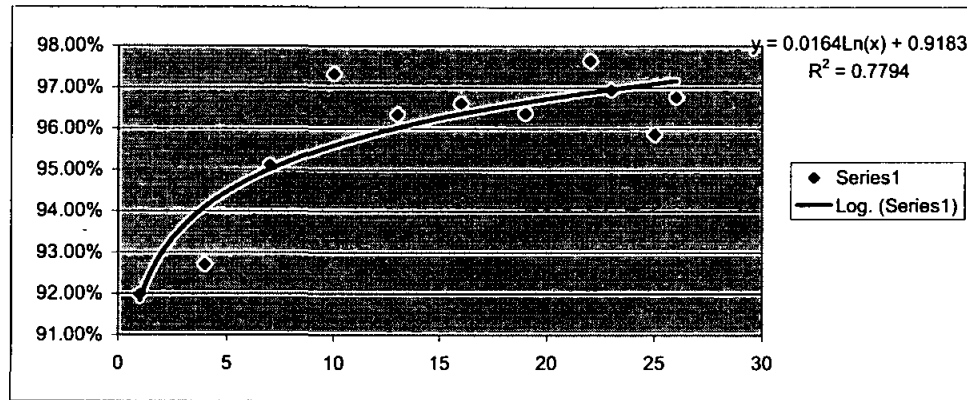
DATA INPUT:

HISTORICAL EMPLOYMENT HEADCOUNT DATA
(Non-PSOM employees: includes T&D, Customer Accts., Customer Svc and A&G)

<u>Date</u>	<u>Period (x) *</u>	<u>% Actual / Budgeted (y)</u>	<u>Actual</u>	<u>Budgeted</u>	<u>Difference</u>
9/30/2006	1	91.98%	1032	1122	(90)
12/31/2006	4	92.70%	1041	1123	(82)
3/31/2007	7	95.12%	1033	1086	(53)
6/30/2007	10	97.33%	1058	1087	(29)
9/30/2007	13	96.34%	1053	1093	(40)
12/31/2007	16	96.61%	1056	1093	(37)
3/31/2008	19	96.37%	1063	1103	(40)
6/30/2008	22	97.65%	1079	1105	(26)
7/31/2008	23	96.94%	1078	1112	(34)
9/30/2008	25	95.86%	1066	1112	(46)
10/31/2008	26	96.77%	1077	1113	(36)

* Because quarterly and monthly data was available, the period values were constructed to represent months in the time series.

RESULTS OF REGRESSION ANALYSIS



SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.882862587
R Square	0.779446348
Adjusted R Square	0.754940387
Standard Error	0.009124129
Observations	11

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.002647874	0.002647874	31.80639753	0.000317737
Residual	9	0.000749248	8.32497E-05		
Total	10	0.003397121			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.918282526	0.007542034	121.7552939	8.63777E-16	0.90122126	0.935343791	0.90122126	0.935343791
X Variable 1	0.016365263	0.002901789	5.639716086	0.000317737	0.009800962	0.022929565	0.009800962	0.022929565

COMPARISON OF EMPLOYEE HEADCOUNT - 2009 TEST YEAR

Date	Period (x)	% Actual / Budgeted (y) ¹	Estimated Headcount ²	Test Year Updates ³	Difference
1/31/2009	29	97.35%	1100	1130	(30)
1/31/2009	29	97.35%	1100	1130	(30)
2/28/2009	30	97.41%	1101	1130	(29)
3/31/2009	31	97.46%	1101	1130	(29)
4/30/2009	32	97.51%	1108	1136	(28)
5/31/2009	33	97.56%	1109	1137	(28)
6/30/2009	34	97.61%	1115	1142	(27)
7/31/2009	35	97.66%	1117	1144	(27)
8/30/2009	36	97.71%	1118	1144	(26)
9/30/2009	37	97.75%	1116	1142	(26)
10/31/2009	38	97.80%	1117	1142	(25)
11/30/2009	39	97.84%	1117	1142	(25)
12/31/2009	40	97.88%	1118	1142	(24)

¹ Derived from the regression equation, $y = 0.0164\ln(x) + 0.9183$.

² Calculated using % actual to budgeted multiplied by 2009 test year non-PSOM employee headcount

³ From HECO-WP-1501 updated (non-PSOM employees)

13-Mo. AVERAGE	1111	1138	(27)	-2.37%
MIDPOINT	1115	1142	(27)	-2.36%
WTD AVG	1111	1138	(27)	-2.37%

13-MO. AVERAGE TOTAL DIVIDE BY 13

MIDPOINT 6/30/2009

WTD AVG (12 Mo.) SUM OF ESTIMATED MONTH TIMES TEST YEAR MONTH DIVIDE BY TOTAL TEST YEAR

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